

REQUEST FOR COUNCIL ACTION

SUBJECT: Multi-hazard Mitigation Plan

SUMMARY: West Jordan participates with Salt Lake County and the other cities within Salt Lake County in the development and adoption of a Multi-hazard Mitigation Plan. The plan seeks to provide mitigation strategies to lessen the impact to the city and its residents in the event of a natural disaster. The plan is required by the Federal Emergency Management Agency (FEMA) on a five-year update cycle.

FISCAL IMPACT: There is no immediate dollar cost to the adoption of the plan strategies.

STAFF RECOMMENDATION:

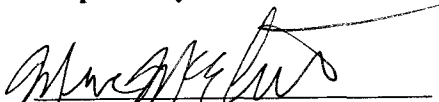
Staff recommends a positive recommendation for support of West Jordan's approach to the overall multi-hazard mitigation plan.

MOTION RECOMMENDED:

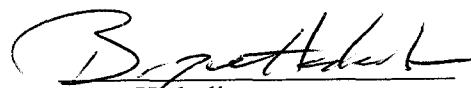
"I motion to adopt Resolution 14-215, to support the strategies put forward in the West Jordan section of the Salt Lake County Multi-hazard Mitigation Plan."


Roll Call vote required.

Prepared by:


Marc McElreath
Fire Chief

Recommended by:


Bryce Haderlie
Interim City Manager


Approved as to form
Jeff Robinson
City Attorney

BACKGROUND DISCUSSION:

The Salt Lake County Multi-hazard Mitigation Plan expires in November of 2014. West Jordan previously participated with the Wasatch Front Regional Council in mitigation plan development. The result was a very generic plan that was copied throughout the state.

For this update, Salt Lake County chose to obtain a grant to develop the plan as a county. They hired a contract employee to assist in the update; unfortunately, the FEMA representatives felt the work did not conform to the plan requirements. The individual cities were then tasked with providing their own annex to the plan.

This plan addresses only the natural hazards that could impact West Jordan and Salt Lake County. The logic behind this kind of plan flows from the fact you cannot prevent all natural disasters. Therefore, rather than prevent the disaster we need to mitigate its effects. The result of mitigation is a reduction in suffering and a reduction in the financial impact required to overcome the disaster.

And it is also important because a hazard mitigation plan must be in place in order to qualify for federal disaster assistance should an event occur where the city needed financial assistance under the Stafford Act or other federal disaster programs.

The focus of public discussion should be page Q64 for the list of strategies and pages Q65 thru Q78 for more detailed information.

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THE CITY OF WEST JORDAN, UTAH NOTICE OF PUBLIC HEARING The City of West Jord	
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**THE CITY OF WEST JORDAN,
UTAH
NOTICE OF PUBLIC HEARING**

The City of West Jordan City Council will hold a public hearing on Wednesday, October 22, 2014, at 6:00 p.m. at West Jordan City Hall 8000 South Redwood Road, 3rd Floor, Council Chambers, to receive comments prior to considering the FEMA Mitigation Plan Update. Copies of the City Council agenda packet for the items listed below will be available at the City offices or on the City Council Agenda webpage the Friday prior to the meeting.

Published this 12th day of October 2014
Melanie S Briggs, MMC
City Clerk
907272 UPAXLP

AFFIDAVIT OF PUBLICATION

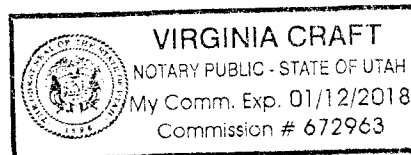
AS NEWSPAPER AGENCY COMPANY, LLC dba MEDIAONE OF UTAH LEGAL BOOKER, I CERTIFY THAT THE ATTACHED ADVERTISEMENT OF THE CITY OF WEST JORDAN, UTAH NOTICE OF PUBLIC HEARING The City of West Jordan City Council will hold a public hearing on Wednesday, October 22, 2014, at 6:00 FOR CITY OF WEST JORDAN, WAS PUBLISHED BY THE NEWSPAPER AGENCY COMPANY, LLC dba MEDIAONE OF UTAH, AGENT FOR THE SALT LAKE TRIBUNE AND DESERET NEWS, DAILY NEWSPAPERS PRINTED IN THE ENGLISH LANGUAGE WITH GENERAL CIRCULATION IN UTAH, AND PUBLISHED IN SALT LAKE CITY, SALT LAKE COUNTY IN THE STATE OF UTAH. NOTICE IS ALSO POSTED ON UTAHLEGALS.COM ON THE SAME DAY AS THE FIRST NEWSPAPER PUBLICATION DATE AND REMAINS ON UTAHLEGALS.COM INDEFINATELY. COMPLIES WITH UTAH DIGITAL SIGNATURE ACT UTAH CODE 46-2-101; 46-3-104.

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THE CITY OF WEST JORDAN, UTAH

A Municipal Corporation

RESOLUTION NO 14-215

A RESOLUTION SUPPORTING THE STRATEGIES OUTLINED IN THE WEST JORDAN SECTION OF THE SALT LAKE COUNTY MULTI-HAZARD MITIGATION PLAN

WHEREAS, the City of West Jordan participates with Salt Lake County and the other cities within Salt Lake County boundaries in the development and adoption of a Multi-hazard Mitigation Plan; and

WHEREAS, the Plan seeks to provide mitigation strategies to lessen the impact to the City and its residents in the event of a natural disaster; and

WHEREAS, a Mitigation Plan must be in place in order to qualify for Federal disaster assistance should an event occur where the City needed financial assistance under the Stafford Act or other Federal disaster programs; and

WHEREAS, the Plan is required by the Federal Emergency Management Agency (FEMA) on a five-year update cycle; and

WHEREAS, the current Salt Lake County Multi-hazard Plan expires at the end of November 2014,

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF WEST JORDAN, UTAH, THAT:

Section 1. The City Council of West Jordan approves and supports the Salt Lake County Multi-Hazard Mitigation Plan to provide mitigation strategies lessening the impact to the City and its residents in the event of a natural disaster.

Section 2. This Resolution shall take effect immediately.

Adopted by the City Council of West Jordan, Utah, this 19th day of November 2014

KIM V. ROLFE
Mayor

ATTEST:

MELANIE S. BRIGGS, MMC
City Clerk

Voting by the City Council

Council Member Jeff Haaga
Council Member Judy Hansen
Council Member Chris McConnehey
Council Member Chad Nichols
Council Member Ben Southworth
Council Member Justin D. Stoker
Mayor Kim V. Rolfe

"AYE"

"NAY"

Multi-Hazard Mitigation Plan

Q.1 Community Profile

Q.1.1 Growth from Town to City

The City of West Jordan was founded by Mormon settlers around 1849. Since the city lies on the western banks of the Jordan River, the city was named West Jordan. West Jordan incorporated as a town in 1941 and incorporated as a city in 1967. Until about 1973, West Jordan remained largely a rural area.

Since then, population growth has been extraordinary, beginning in the 1970s and continuing unabated since. The population grew from 4,221 in 1970 to 27,192 in 1980. In 1990 it reached 42,892, and in 2000 it was 78,788, an 83.7% increase. Today West Jordan is Utah's fourth largest city, with an estimated population in March of 2014 over 108,000 residents.

The city occupies the west-central portion of the Salt Lake Valley, which is surrounded by the Oquirrh and Wasatch mountains. It shares borders with Taylorsville, Kearns, South Jordan, Sandy, Murray, Midvale, Copperton, West Valley City and unincorporated Salt Lake County. West Jordan is fortunate to have a large share of vacant land left for future growth within Salt Lake County.

DEMOGRAPHICS

West Jordan Residents	
Population	108,362
Median Age	28.2
Population Under 18 Years	34.5%
Population Over 65 Years	4.5%
Average Family Income	\$79,490

MISCELLANEOUS STATISTICS

City Government	
Year of Incorporation	1941
Present Form of Government Adopted	May 26, 1981
Form of Government	Council/City Manager
City Land Area	32 sq. miles

EDUCATION

Number of Elementary Schools	17	Number of Charter Schools	4
Number of Middle Schools	4	Number of Technical Schools	1
Number of High Schools	2	Number of Special Needs Schools	1
Community College Campus	1	Private College Campus	1

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CULTURE AND RECREATION

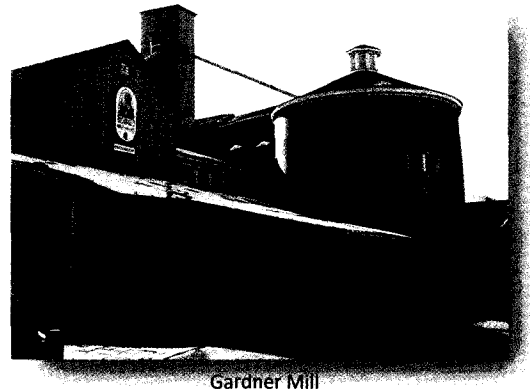
Acres of Parks, Trails & Open Space	839
Number of Baseball/Softball Fields	20
Number of Soccer Fields	20

Q.1.2 History

A Brief History of West Jordan (Derived from West Jordan General Plan 2012)

Settlement of the land along the Jordan River in the area that is now West Jordan began in the fall of 1849. Due to the imminent onset of winter and the lack of readily available timber, the first homes were “dugouts” excavated into the hillsides above the river. Most of these dugouts were replaced the following spring as soon as weather permitted the hauling of timber from Bingham Canyon. By 1853, the population of the West Jordan area was 361.

The Jordan River, like the River Jordan in Palestine, flows from a fresh water lake (Utah) to an inland salt sea (the Great Salt Lake). Early settlers recalled the “good old days” when the Jordan River would fill to its banks and create dangerous whirlpools. It is reported in several old histories that the bridge between Midvale and West Jordan washed out every spring. At one time, a ferry provided river crossings until a substantial bridge could be built.



Gardner Mill

Archibald and Robert Gardner built the first saw mill in the area in 1850, powered by a 2 ½ mile long mill race, the first important canal in Utah. Lumber to supply the mill was hauled fourteen miles from the Oquirrh Mountains to the west. In 1854, Archibald added a grist mill to the site which introduced some excellent machinery to the area. The Gardner Mill is still standing at approximately 1050 West 7800 South. The current owners have converted it into Gardner Village, a theme restaurant and retail shops, reminiscent of the days of Archibald Gardner.

The first blacksmith’s shop in south Salt Lake County belonged to Alexander Beckstead who settled in West Jordan in 1850. The shop was completed in 1853 and operations consisted of setting wagon ties, repairing wagons and farm implements, sharpening plows, and shoeing.



In 1851, Matthew Gaunt started a woolen mill. In that same year, Samuel Mulliner tanned leather in the first tannery built west of the Mississippi River.

Multi-Hazard Mitigation Plan

School opened in West Jordan for the first time in 1852. Classes were held in a small log house, about 14 by 15 feet, situated southwest of the West Jordan Ward Meeting House at 1137 West 7800 South.

In the fall of 1854, a handful of people looking for a place to farm, came to a clear stream of water. This was Bingham Creek, which runs east from the Oquirrh Mountains and winds its way down to the Jordan River. During their explorations, the many signs of Indians convinced the group that they could not live in safety without some means of protection, which led to the construction of Wight's Fort (at about 3600 West on 9000 South). The four walls of the fort, each 12 feet high, were constructed of stones, earth, and logs. When completed, the structure was large enough to enclose and protect seven log houses, and part of the much-valued stream. The fort had two large gates, one on the east and the other on the west. By the spring of 1855, the wives and children of the fort builders had settled in. The families of Wight's Fort lived and prospered there until 1859. Lack of water forced settlers to abandon the site in 1861. For many years after, the only road to Bingham Canyon ran through the fort gates. Today, all that remains of the settlement at Wight's Fort is the Wight's Fort Cemetery located at approximately 3500 West 9000 South.

West Jordan's first post office opened in 1864 in a small adobe house adjacent to the West Jordan Ward Meeting House. In 1900, the Rural Free Delivery of mail (RFD) was begun from Sandy to West Jordan. Carriers delivered mail first by horse and buggy and later by Model T Ford. The current West Jordan Post Office has been renamed to honor Solon Richardson Jr., the first West Jordan Rural Free Delivery mail carrier.

It was in the West Jordan Ward Meeting House that the first mining claim in the Utah Territory (for the Jordan Silver Mining Company) was filed on September 7, 1863, after the discovery of mineral-bearing ore in Bingham Canyon by George B. Ogilvie. The following December, documents were prepared that organized the West Mountain Mining District in the Oquirrh Mountains under the direction of Col. Patrick E. Connor.

Dozens of small mining companies developed underground properties to recover lead, silver, and gold in Bingham Canyon. Copper became the most sought after mineral thanks to the vision of Daniel C. Jackling who organized the Utah Copper Company on June 4, 1903, now part of Rio Tinto (formerly Kennecott Copper Corporation). What was once a 1,500-foot-high hill in Bingham Canyon is now the largest man-made excavation on earth: Kennecott's world-famous Bingham Canyon open pit copper mine.

In 1891, the first sugar beets were raised in West Jordan. A factory was built in 1916 by the Dyer Construction Company. The work at the factory was seasonal. At its peak, it employed 235 people from mid-October to the end of December. An estimated 285,000 bags of sugar



Utah-Idaho Sugar Factory

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were produced annually in the 1950's. However, in the 1970's, the sugar beet market disappeared, and the factory closed its doors. In January 2011, the Utah-Idaho Sugar Factory was demolished due to structural and safety deficiencies.

Few people are aware of the role West Jordan has had in Utah aviation history. Significant landmark events include what is believed to be the first powered airplane flight in Utah, made by Lagar R. Culver on February 18, 1910. In 1941, Salt Lake City Airport II was authorized and began official operation on June 25, 1943. The airport was constructed by the U.S. Army Corps of Engineers as part of the national defense system, serving during World War II as a military pilot training facility. It was known during World War II as Kearns Army Airfield and provided operational training for personnel and units during the war, and was part of the larger Kearns Army Air Base (later renamed Camp Kearns) which was a major Air Force basic and technical training facility for personnel being reassigned to one of the combat zones overseas. The Army sold the airport in 1945, and it is currently owned and operated by Salt Lake City. In 1977, Salt Lake City Airport II became the location of the Utah National Guard's Aviation Support Facility. It was recently renamed the South Valley Regional Airport and continues to be a vital and significant regional aviation asset.

The first electric lights in West Jordan were installed in 1916. Early homes were equipped with a single clear light globe attached to a cord dangling from the ceiling.

The residents of West Jordan petitioned the County Commission for incorporation as a town in 1941. West Jordan became a third-class city in 1967, and after reaching a population of 104,128 residents, West Jordan officially became a first-class city on December 3, 2007.

Historic Sites

Existing and Potential Historic Sites - Criteria used to determine eligibility of districts or buildings for landmark status have been established at the federal level to evaluate sites that may be eligible for listing on the National Register of Historic Places. Briefly, landmark sites must be at least 50 years old, have maintained a high degree of integrity from the period in which they were built, and have contributed to broad patterns of the city's history. Historic districts must be composed of at least 51% contributing properties, as determined in a professionally conducted survey. Contributing properties are those which are over 50 years old and have retained a high degree of integrity.

There are three sites in the city currently listed on the National Register (see Figure 8.1 below) and several more that are generally acknowledged as meeting the eligibility criteria. Sites with potential for listing on the National Register include Wight's Fort Cemetery and the Welby Townsite.

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Figure 1.2.1 - National Register Listings

NATIONAL REGISTER SITES, WEST JORDAN, UTAH						
Row	STATE	COUNTY	RESOURCE NAME	ADDRESS	CITY	LISTED
1	UT	Salt Lake	Gardner Mill	1050 W. 7800 South	West Jordan	9/29/1982
2	UT	Salt Lake	West Jordan Ward Meetinghouse (Pioneer Hall)	1137 W. 7800 South	West Jordan	4/14/1995
3	UT	Salt Lake	Utah-Idaho Sugar Factory	2140 W. Sugar Factory Road	West Jordan	2/13/2009

The Gardner Mill site is privately owned and is currently utilized as a retail/commercial center offering various shops and restaurants for the residents of West Jordan and Salt Lake County.

The West Jordan Ward Meetinghouse (also known as Pioneer Hall or the Old Rock Church) is currently owned by the City of West Jordan and utilized as the home of the local chapter of the Daughters of Utah Pioneers. This facility is maintained and rented to the public for social gatherings, weddings, family reunions, etc. This facility was completely renovated during 2006-2007 with a congressional appropriation.

Utah Century Farms and Ranches - As a part of Utah's centennial celebration in 1996, a program was initiated by the Utah Department of Agriculture and Utah Farm Bureau Federation to recognize and honor family farms and ranches in the State that have been owned by the same family for 100 years or more. All landowners received a special certificate and permanent "Century Farm & Ranch" sign for their property. Five of these farms were located in West Jordan at some point: the Malmstrom Family Farm; Drake Family Farm; Bateman Dairy Farms Inc.; Gardner Heritage Farm; and the Cook Family Farm. Since the "Century Farm and Ranch" program was established, the Bateman Dairy Farm has been developed into a residential development leaving only four active farms in the program.

Historic Surveys - Conducting a historic resource survey, known as a "reconnaissance survey," is the first step in preparing a National Register nomination for an historic district. The survey determines the concentration of contributing versus non-contributing properties and identifies patterns of development that help describe the history of a community. A reconnaissance survey identifies patterns of development that help describe the history of a community. A reconnaissance survey also identifies properties that are worthy of further study, known as an intensive-level survey. Intensive level surveys are also necessary for the preparation of a National Register nomination for a district. There is no record of historic surveys having been done in West Jordan. However, they are a valuable tool in any historic preservation program,

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and the West Jordan Historic Preservation Commission is currently in the initial stages of developing such a survey for the city.

Incentives for Historic Preservation

Government agencies and nonprofit organizations offer incentives to assist property owners in maintaining and restoring historic properties. The most commonly used sources of funding and information are listed below.

Utah State Historic Preservation Office (SHPO) - The Utah State Historic Preservation Office administers the state and federal tax credit programs. The SHPO also administers federal funding for Certified Local Government programs, which provides communities access to preservation programs, tools and resources.

State of Utah Certified Local Government Program (CLG) - Once a city or county passes an approved historic preservation ordinance and appoints a historic preservation commission, then that government becomes recognized as a "Certified Local Government." The City of West Jordan has completed this process and is currently eligible for financial and technical assistance under the CLG program.

National Trust for Historic Preservation - Established in 1949, the National Trust has shown how preservation can play an important role in strengthening a sense of community and improving the quality of life. The National Trust offers small planning and design grants for communities with historical buildings.

State and Federal Tax Credits for National Register-Listed Properties - Owners of property listed on the National Register of Historic Places are eligible to obtain a 20% federal income tax credit for rehabilitation of income-producing properties and a 20% state income tax credit for residential properties (this includes residential income producing properties). All work performed on the property must comply with the Secretary of the Interior's *"Standards for Rehabilitation."* The staff of the Utah State Historic Preservation Office reviews and processes these applications.

Utah Heritage Foundation - The Utah Heritage Foundation, a nonprofit statewide preservation advocacy organization, offers loans for purchase and rehabilitation of historic buildings. To qualify, a property must be at least 50 years old and retain its architectural integrity. Approval of loan applications is based on a number of criteria, including the historic appropriateness of the proposed renovation and the availability of loan funds.

Q.1.3 Property/Land Use (Derived from West Jordan General Plan 2012)

Existing Conditions

Approximately 6,500 acres of land in West Jordan remains vacant or is used for agricultural uses. It is expected that the majority of this unimproved land will be developed within the next 20 to 30 years, at which time, the city will have a build-out population of approximately 160,000 residents. Much of this population growth is projected to be generated internally, where regionally it is projected that the northern Wasatch Front will grow to near 2.7 million residents by 2020.

Current Land Use

A survey of current land use in the city was completed in April 2010. Figure 1.3.1 summarizes the percent of the total area of the city that each type of use occupies. As the table indicates, agricultural land and land that is currently vacant and unimproved accounts for the highest percentage (29.97%) of land in the city. Single-family residential is the next largest land use at 29.57%).

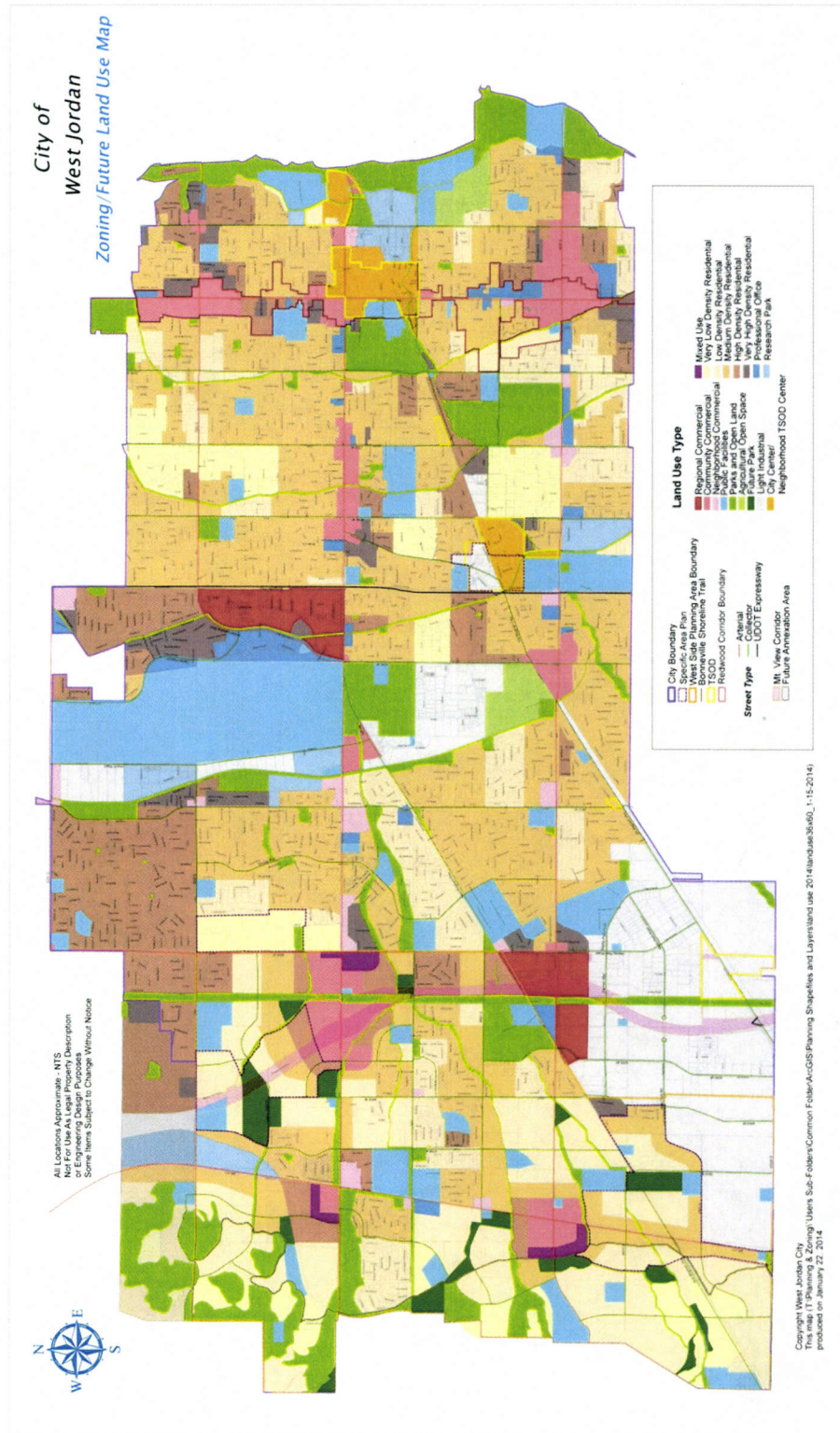
The Current Land Use Map (see map in the appendix and on the City of West Jordan website) brings into sharp focus that the city has a considerable amount of agricultural land, most of which is primarily located west of 5600 West. The eastern portion of the city is essentially developed which means that any future development, or redevelopment, will consist primarily of infill. The western portion of the city is where the majority of growth will occur in the future.

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Figure 1.3.1 - Historic and Projected Population

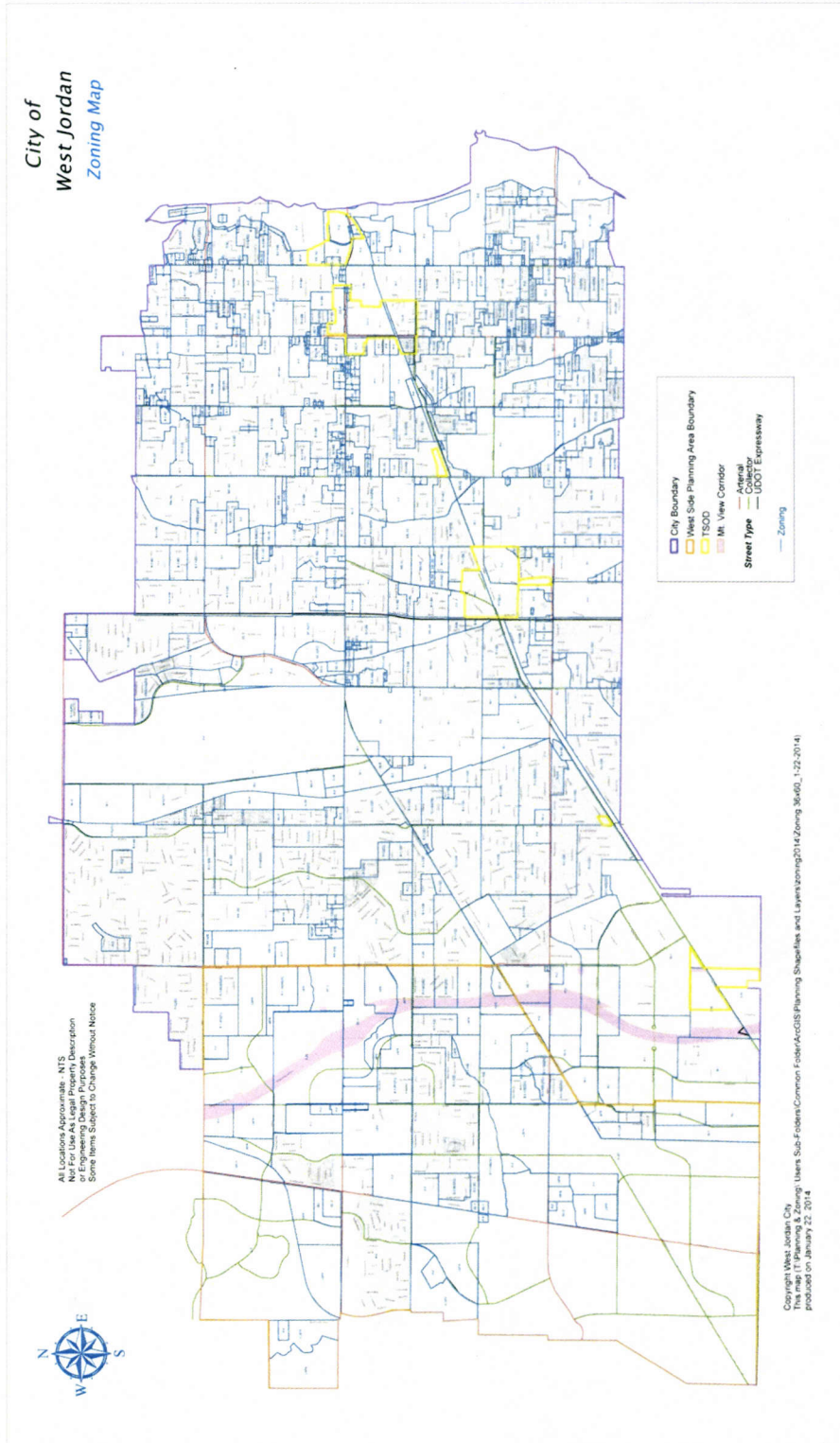
Land Use Type	Land Use Acreage	% of Land
Agriculture/Vacant	6141.39	29.97%
Single Family	6058.8200	29.57%
Streets/Roadways	2657.0000	12.97%
Industry	1548.2700	7.56%
Public Facility	1507.3100	7.36%
Park/Open Space/Common Area	836.2700	4.08%
Commercial/Retail/Service	570.7500	2.79%
School	445.6600	2.17%
Multi-Family	230.7300	1.13%
Religious Institution	230.1800	1.12%
Professional Office	103.1900	0.50%
Group Care Facility	98.4500	0.48%
Medical	52.9900	0.26%
Duplex/Town Home	11.7700	0.06%
Total Acreage	20492.78	

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Map showing Zoning and Future Land Use.

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Map showing West Jordan Zoning.

Q.1.4 Population and Demographics

(Derived from West Jordan General Plan 2012)

Historic Population Growth

West Jordan was incorporated as a town on January 10, 1941. The first U.S. Census taken for West Jordan in 1950 reported a population of 2,107. According to the 2010 U.S. Census, the population of West Jordan has increased over 49 times to 103,712. During the same time period, the population of Salt Lake County increased only threefold. A comparison of West Jordan's growth to Salt Lake County is illustrated in Figures 1.4.1 and 1.4.2.

Figure 1.4.1 - Historic Population West Jordan

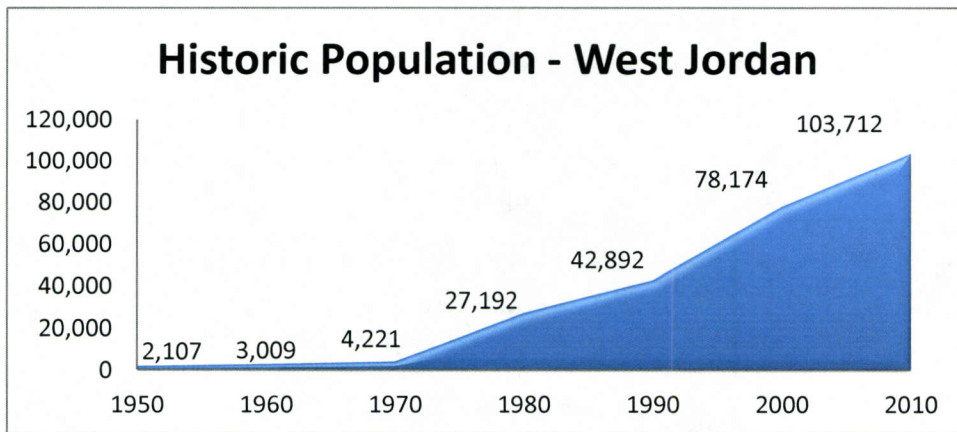
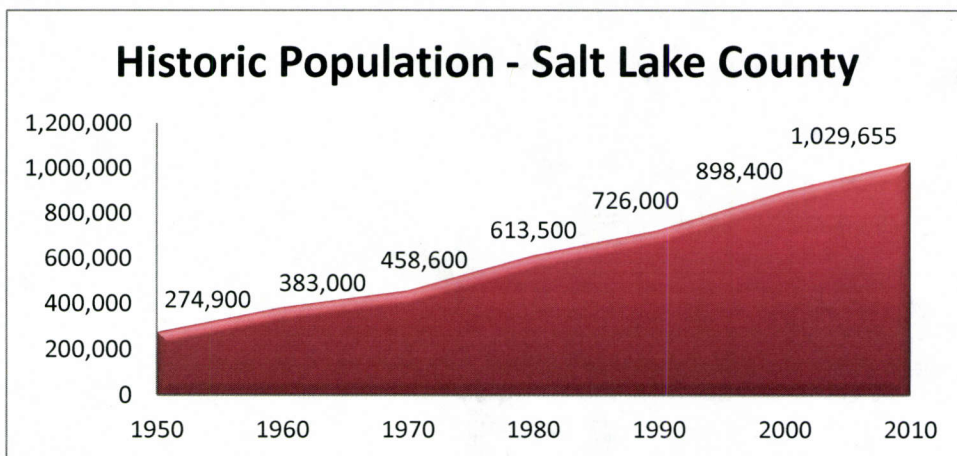


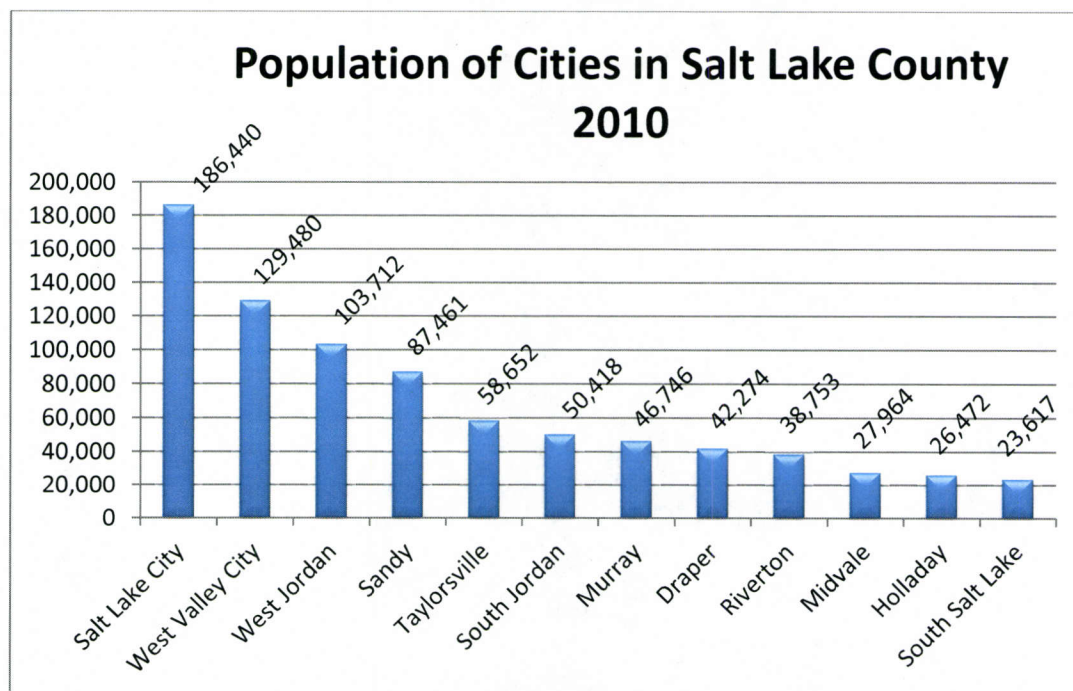
Figure 1.4.2 - Historic Population Salt Lake County



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As illustrated in Figure 1.4.3, West Jordan is now the third-largest city in Salt Lake County and, according to state-wide figures, the fourth-largest city in Utah. Since the 1990 Census, West Jordan has seen a population increase of 141%, or an average annual increase of 5.0%. Population growth is attributable to a combination of both annexations and residential development. Continued population growth is expected as housing needs in Salt Lake County create demands on undeveloped land within the city's boundaries. Population growth will continue to present many challenges to, and opportunities for, improving the quality of life in West Jordan.

Figure 1.4.3 - Population of Cities in Salt Lake County

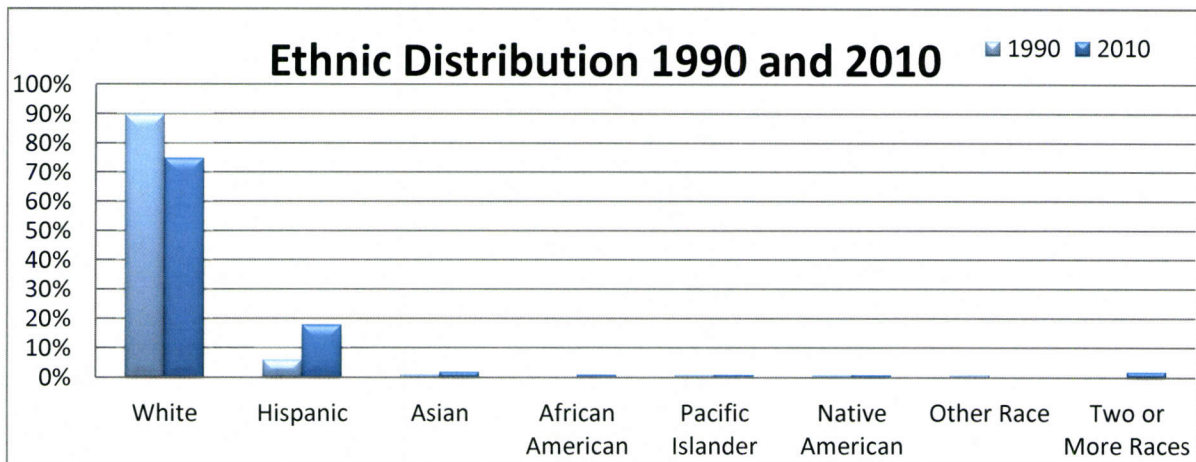


Ethnic Distribution

Figure 1.4.4 shows that there has not been significant change in the ethnic composition of West Jordan's population since the 1990 Census. By far, the largest single ethnic group is still White/Caucasian. The greatest increase in the minority population has been in the Hispanic segment of the city's population.

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Figure 1.4.4 - Ethnic Distribution



Age and Education

The population of West Jordan is fairly young, as shown by Figure 1.4.5. The median age of a West Jordan resident is 28.2 years old (2010 U.S. Census). According to the U.S. Census Bureau's 2005-2009 American Community Survey, 89.9% of residents over the age of 25 are high school graduates, and 22.4% have received bachelor's degrees (Figure 1.4.6)

Figure 1.4.5 - Age Distribution

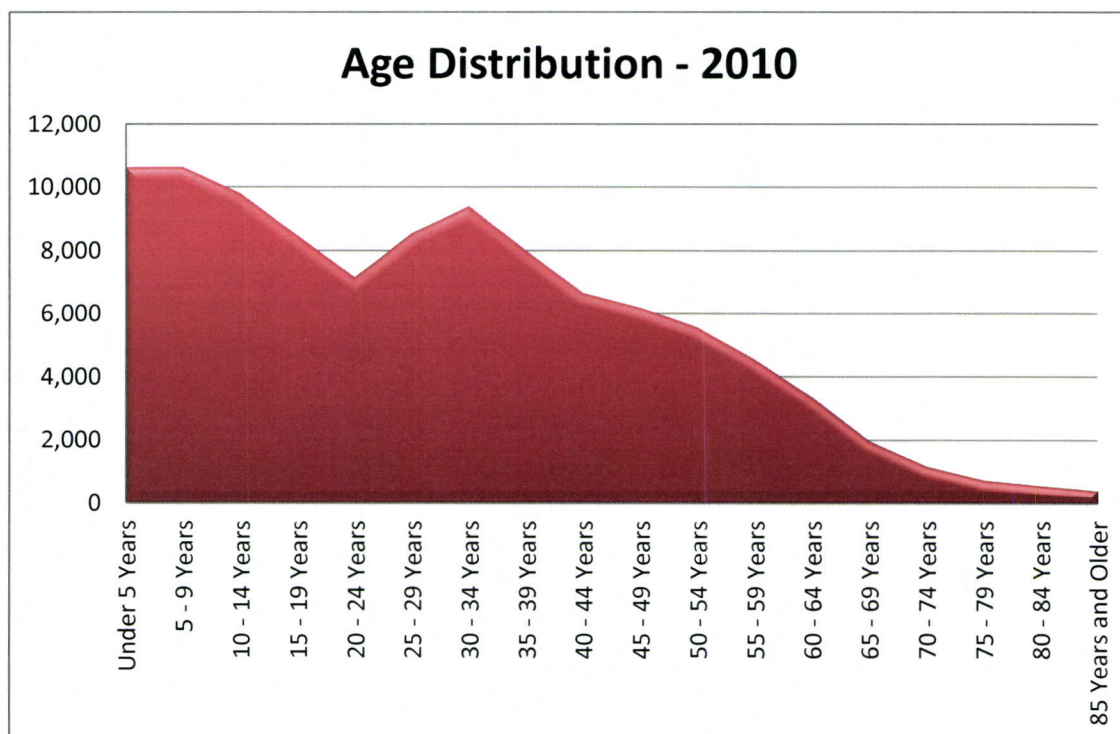
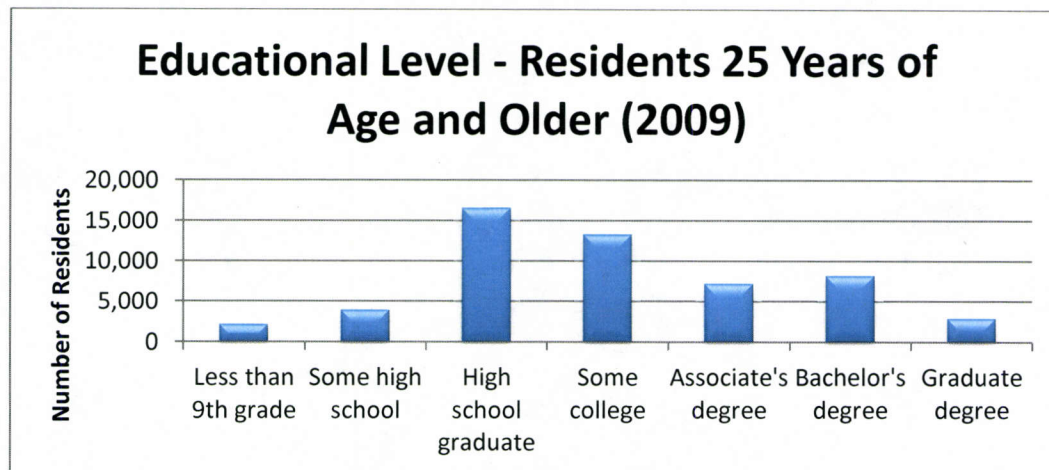


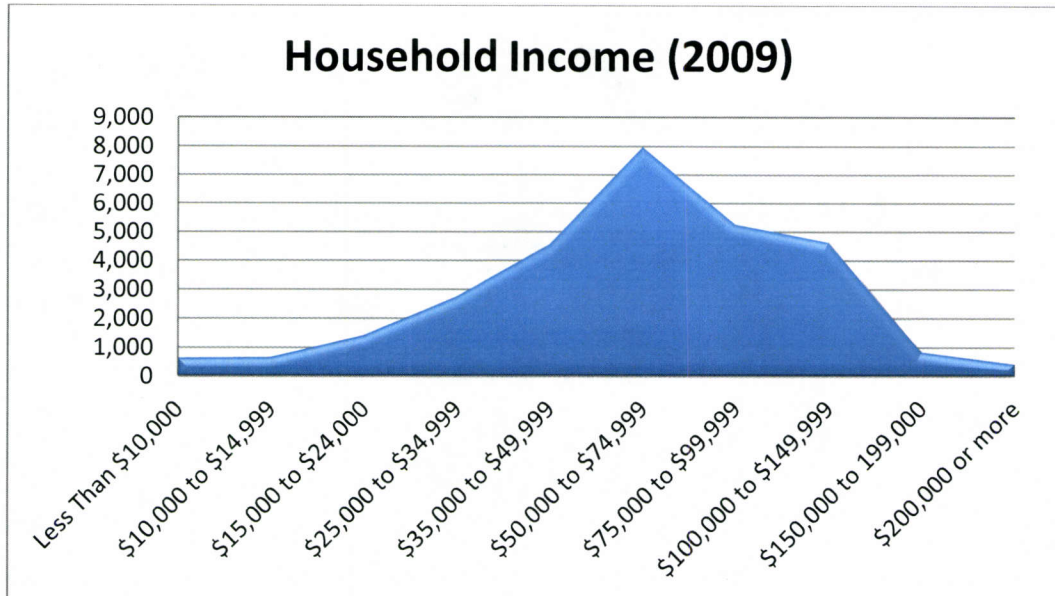
Figure 1.4.6 - Education Level



Household Income

West Jordan families enjoy an income level that is slightly higher than in Salt Lake County as a whole (Figure 1.4.7). According to the U.S. Census Bureau's 2005-2009 American Community Survey, the median family income in West Jordan is \$67,986 compared to \$66,413 for all of Salt Lake County. It should be noted, however, that per capita income is lower (\$21,333 vs. \$24,911). This is attributable to the fact that the average family size in the city is greater than that of Salt Lake County (3.46 vs. 3.58 persons per household).

Figure 1.4.7 - Household Income



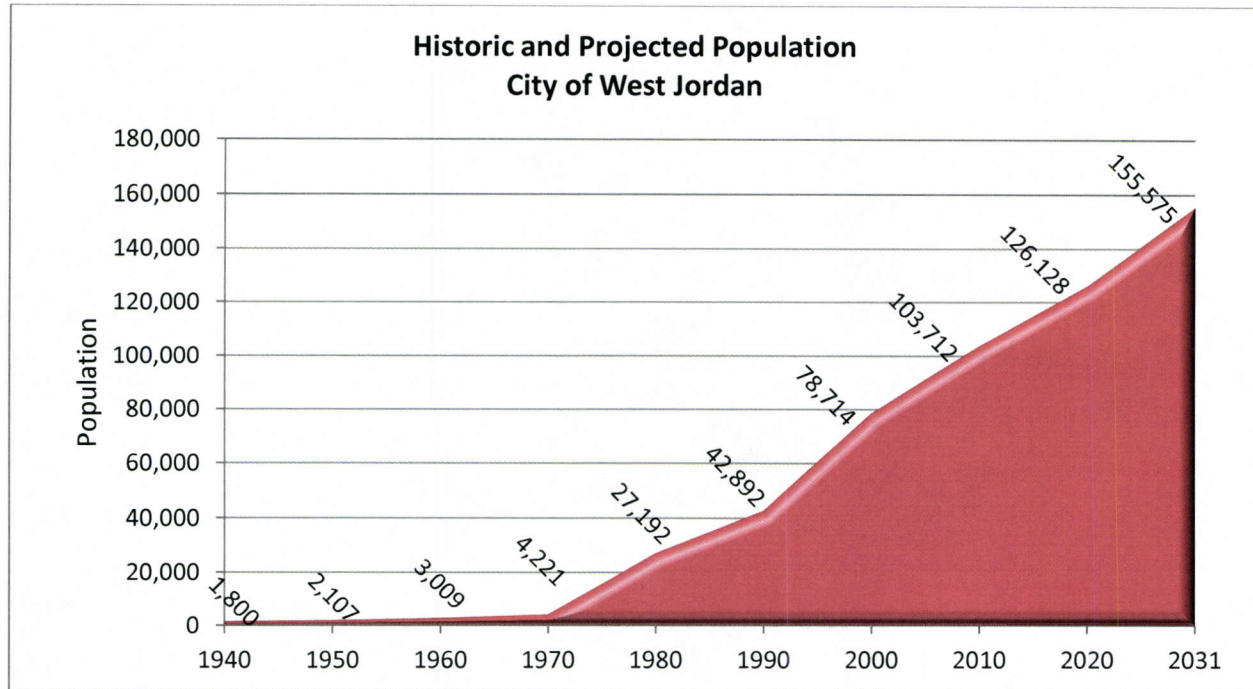
Population Projections

Population projections are a best guess at what the future holds based on past trends. The city experienced a period of higher than normal residential growth during 2005 and 2006. However, the economic downturn during 2008 and 2009 slowed residential construction and population growth dramatically. The 2010 Census reported West Jordan had a population of 103,712. It is estimated that West Jordan's population will increase to over 155,000 by 2031.

Figure 1.4.8 graphically displays historic population and anticipated population increase for West Jordan through the year 2031.

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Figure 1.4.8 - Historic and Projected Population



Q.1.5 Employment and Economy

(Derived from West Jordan General Plan 2012)

Introduction

The attraction of new businesses into an economy will increase the tax base, job supply, economic vitality, and diversity of the local economy. The attraction and retention of new and existing commercial, professional, and manufacturing businesses and industries is vital to provide the quality services and jobs that West Jordan and its residents demand. New opportunities for commercial, professional, and manufacturing development are anticipated to occur near transit stations along the TRAX light rail line, along the future Mountain View Corridor, and along U-111, which will further enhance the city's economy.

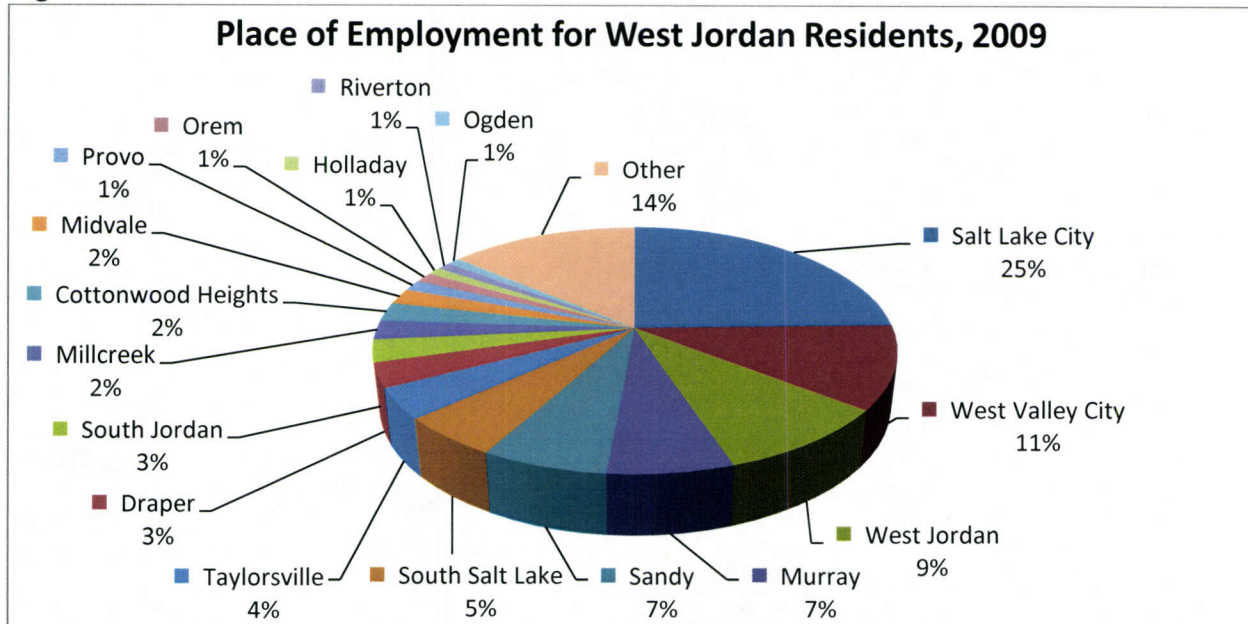
Employment

Figure 1.5.1 below, which illustrates where West Jordan residents travel to work, shows that nearly 91% of the city's residents who are employed, commute outside the city limits to work. Approximately 25% of these employees work in adjoining communities, including Sandy City, West Valley City, South Jordan, and Taylorsville, while another 25% work in Salt Lake City. Approximately 9% work within the city limits, as shown in Figure 1.5.2, which shows the percentage of workers that are employed in their city of residence along the Wasatch Front. Of

Multi-Hazard Mitigation Plan

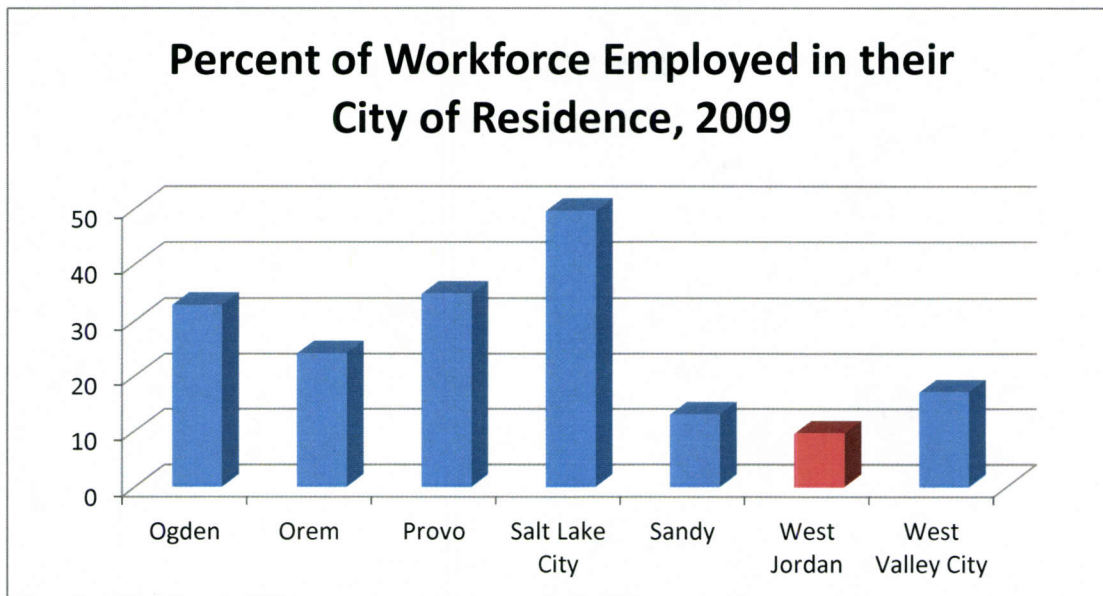
the seven largest Utah cities, West Jordan has the smallest percentage of its population which is also employed in their city of residence.

Figure 1.5.1



Source: U.S. Census Bureau, Center for Economic Studies (2009).

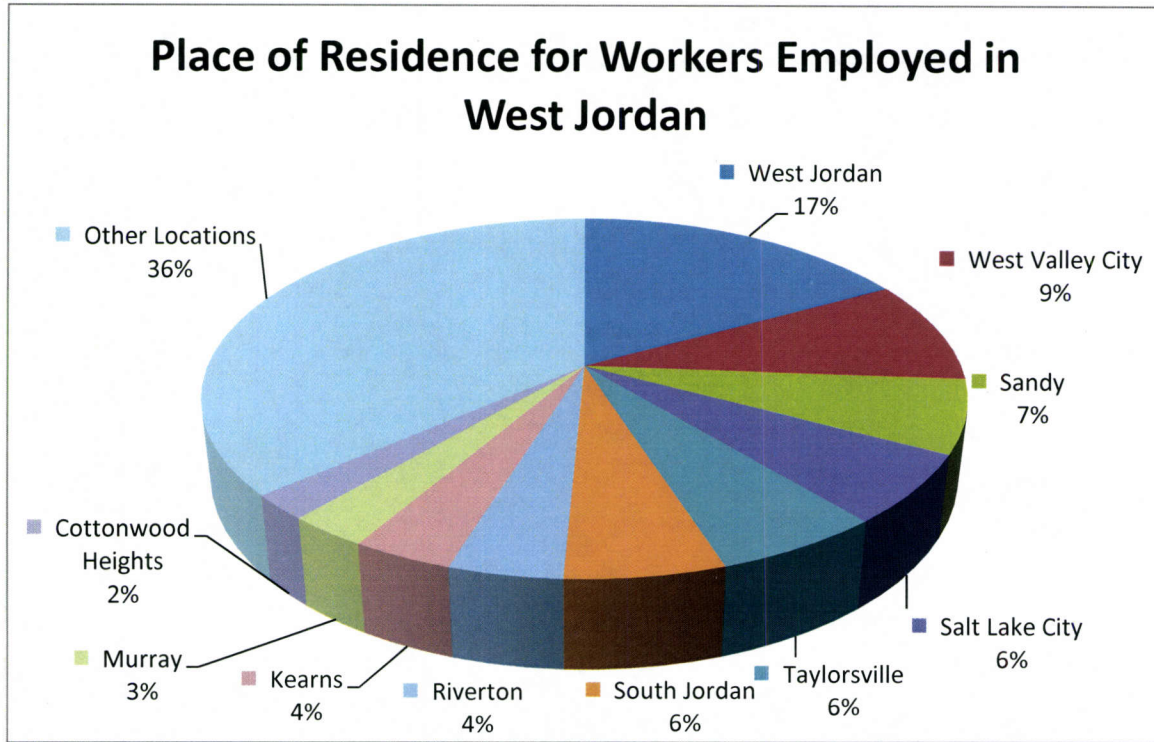
Figure 1.5.2



Source: U.S. Census Bureau, Center for Economic Studies

Figure 1.5.3 below indicates that the majority of employees who work in West Jordan live in Salt Lake County. However, there is a great degree of variation between places of residence of these workers, with no single locality, other than West Jordan, having a share greater than 10%.

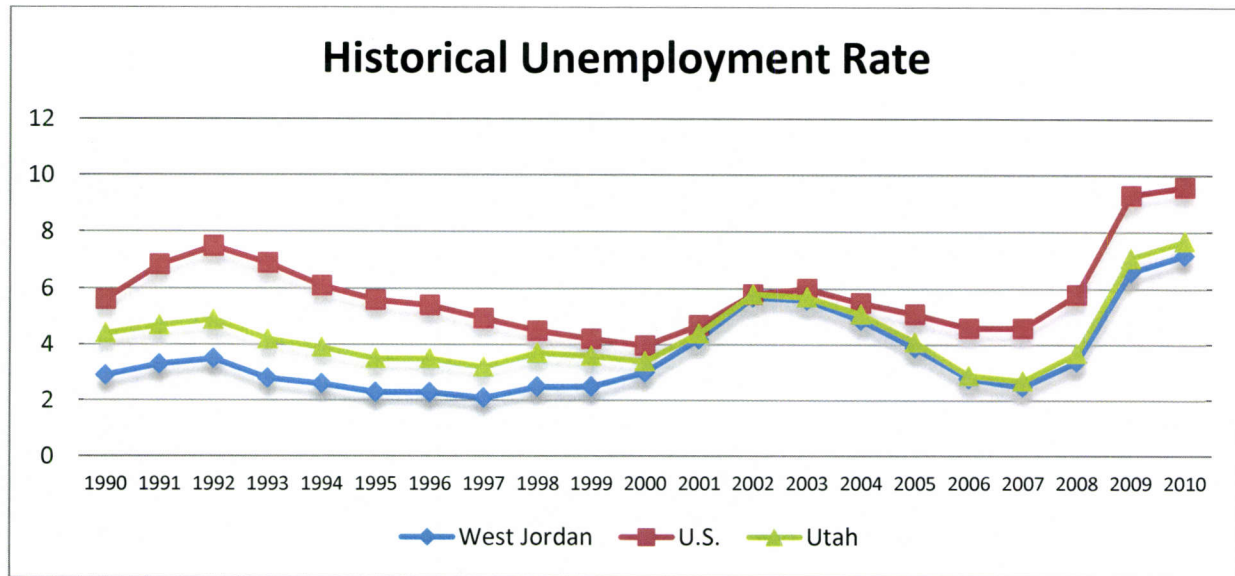
Figure 1.5.3



Source: U.S. Census Bureau, Center for Economic Studies

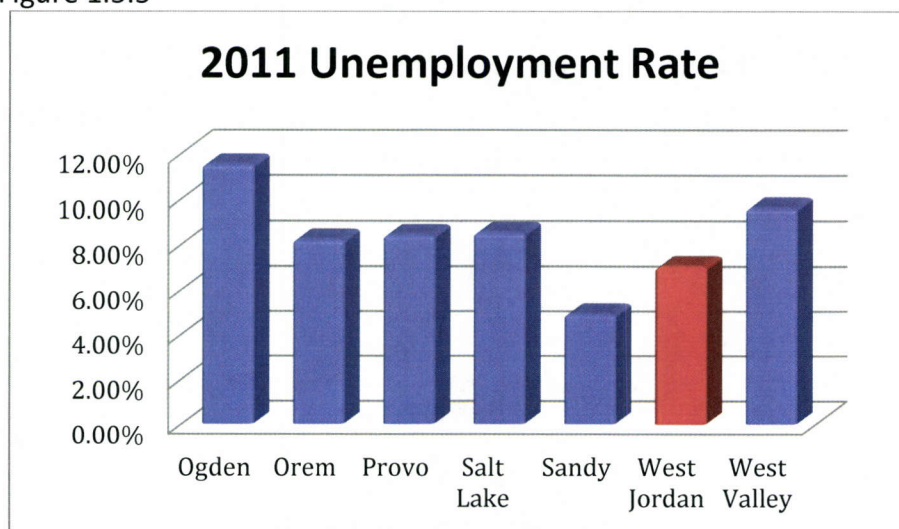
Figure 1.5.4 shows the historical unemployment rate of West Jordan compared to that of the State of Utah and the United States. The unemployment rate of West Jordan has typically moved in concert with both the national and statewide unemployment rate, although West Jordan has enjoyed overall lower rates of unemployment, with the exception of the 2001 recession, when the municipal, state, and national rates were essentially identical. Figure 1.5.5 shows West Jordan's unemployment rate as compared to other large cities in the state for 2011. Currently, West Jordan enjoys one of the lowest unemployment rates among the largest cities in the state.

Figure 1.5.4



Source: U.S. Bureau of Labor Statistics (2010)

Figure 1.5.5



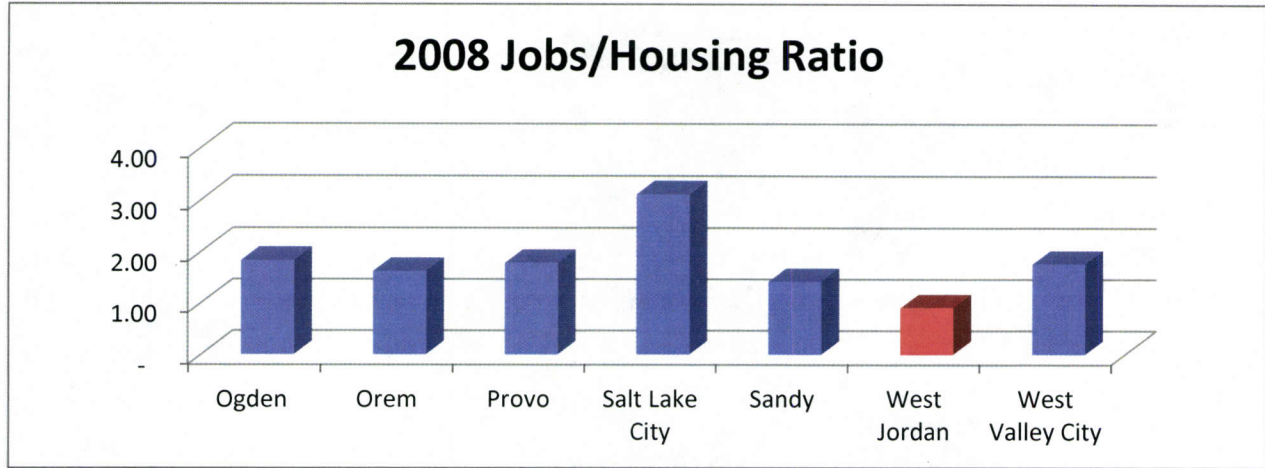
Source: U.S. Bureau of Labor Statistics (2011)

Jobs to Housing Ratio - West Jordan has historically been considered a “bedroom community” where many people commute outside the city for employment. The jobs to housing ratio is used primarily to illustrate the number of total jobs compared to the residential population of the city. It is an indicator of the number of people who work in the city divided by the number of housing units located in the city. A ratio greater than 1.0 indicates a net in-commute into the city and a ratio less than 1.0 indicates a net out-commute. A ratio of 1.0 indicates a balance. West Jordan currently has a jobs to housing ratio of 0.88 which is indicative of a bedroom community.

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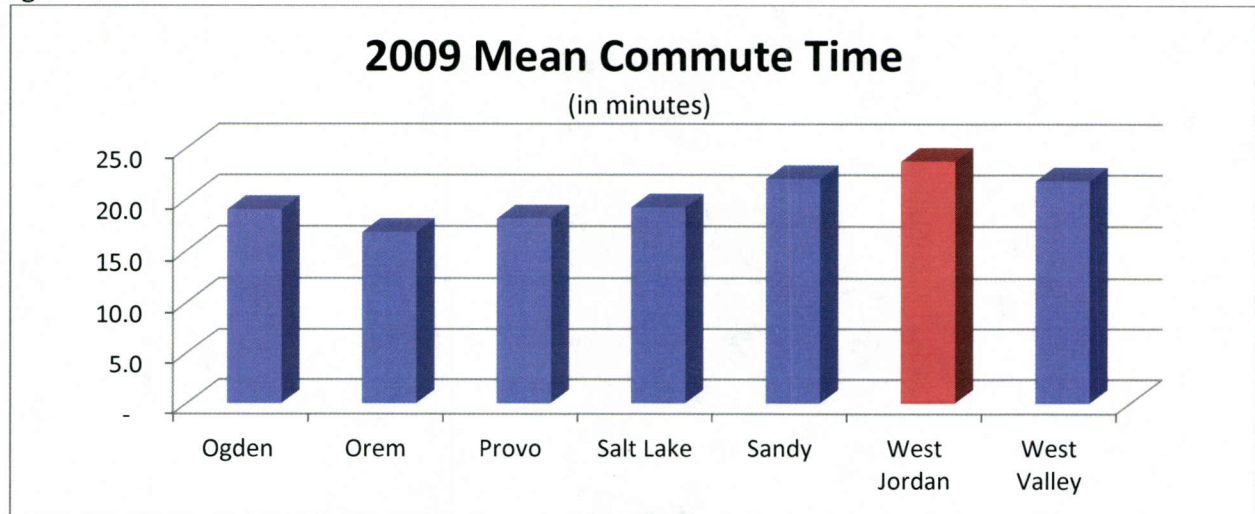
Figure 1.5.6 below demonstrates the jobs to housing ratio for the largest cities in the state, with each city having a ratio exceeding 1.0, with West Jordan being the lone exception. As a consequence of the city's low jobs to housing ratio, the average commute time for residents is the highest among the seven study cities as illustrated in Figure 1.5.7.

Figure 1.5.6



Source: U.S. Census Bureau; Utah Department of Workforce Services

Figure 1.5.7



Source U.S. Census Bureau (2009)

As a means of creating a more economically sustainable community, the City should begin looking at ways to increase the jobs to housing ratio as a way to increase its tax base, its daytime population, and provide more opportunities for people to live and work in the city.

On the City's Future Land Use Map, professional office uses account for 1.41% of the land within the city and 0.5% of the city's new development. Adding office space in areas designated as Mixed-Use and City/Neighborhood Center on the Future Land Use Map increases this number to 4.89%. This number is still quite low considering Light Industrial uses make up 9% of the future land uses in the city and commercial uses (including Mixed-Use and

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City/Neighborhood Center) make up 8.09%. Given this, the City should consider increasing the area devoted to professional office and other non-residential uses such as education, manufacturing, and general services to increase the jobs to housing ratio and make land use percentages more consistent with other non-residential land uses. Opportunities for increasing employment in the city are located near transit stations, interchanges along the Mountain View Corridor, Redwood Road, and the South Valley Regional Airport.

Floor Area Ratio - The City should also consider increasing the intensity of office uses as well as the overall acreage designated for such uses. Intensity of land usually describes non-residential uses and takes into consideration general floor area, percentage of lot coverage, and the number of stories a particular development has. Floor Area Ratio (FAR) describes intensity as the relationship between the total square footage of development on a lot and the area of that lot. Floor area does not include the area within parking structures and parking lots. The FAR is determined by dividing the gross floor area of all buildings on a lot by the gross land area of the lot. The current average FAR for existing office development within the city is 0.33. This means that about one-third of the lots used for office are actually developed with buildings, with the remaining two-thirds being used for parking and/or landscaping. By increasing the amount of allowed FAR, the city can increase the floor area of office uses within the city, by increasing the lot coverage and the number of stories allowed within office areas.

As demonstrated in Figure 1.5.8, the existing average FARs for other types of uses are also low. Increasing the FAR in all non-commercial zones would benefit the city by providing a larger daytime population, increasing the tax base, and providing opportunities for residents to both live and work within the city.

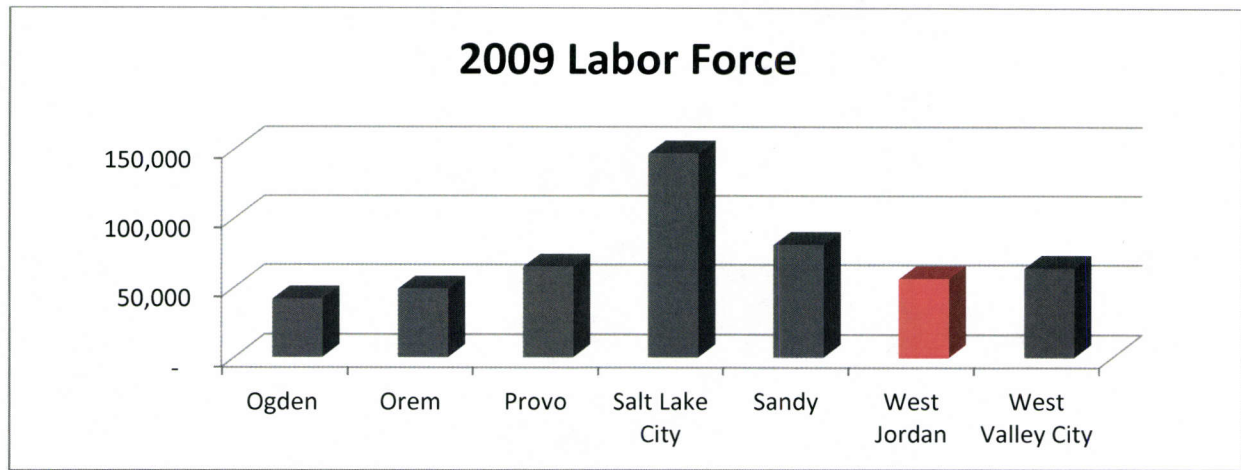
Figure 1.5.8 Existing Average FAR (2010)

Use Type	Existing Average FAR
Office	0.33
Commercial	0.25
Industrial	0.18
Institutional	0.20

The available pool of labor for each of the seven largest cities in the state is shown in Figure 1.5.9 below. Generally, the size of each city's labor force matches its ranking in relation to the total residential population.

Figure 1.5.9

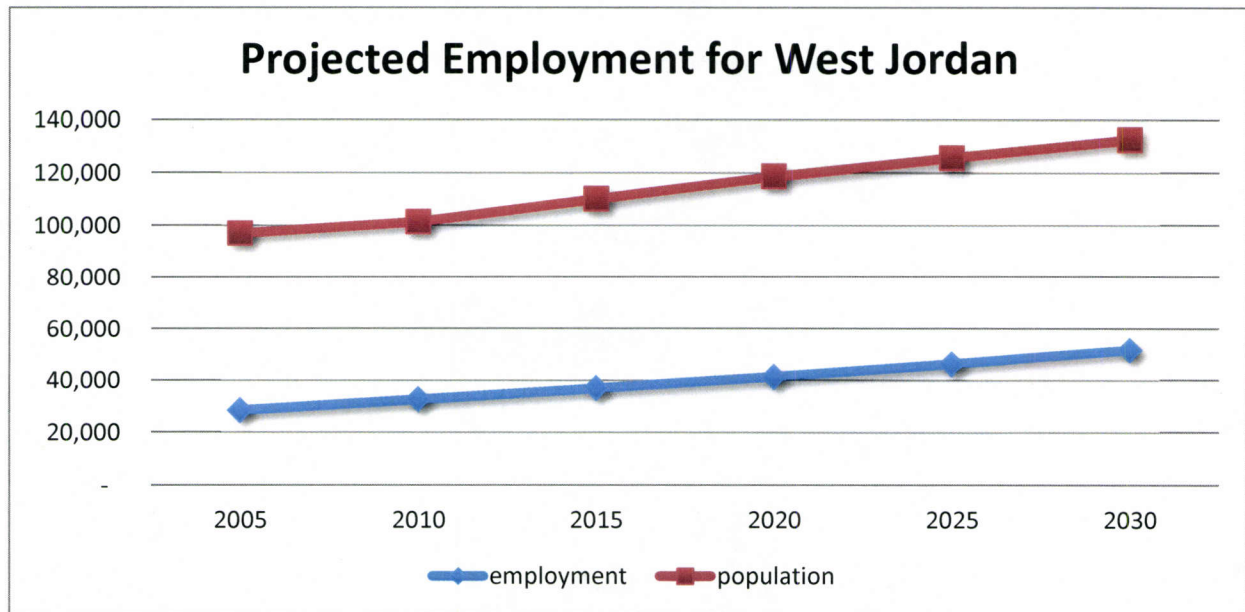
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Source: U.S. Census Bureau (2009)

Figure 1.5.10 shows the projected employment for West Jordan to the year 2030. Estimates for future employment in West Jordan show positive growth, as the number of current jobs is anticipated to nearly double by 2030, when employment will reach approximately 50,000. Total employment is expected to grow at a rate over 1% more annually than the general population, which by 2030 will have increased by approximately one-third. However, the gap between employment and the population grows from approximately 70,000 in 2005 to 80,000 in 2030.

Figure 1.5.10



Source: Wasatch Front Regional Council (2009)

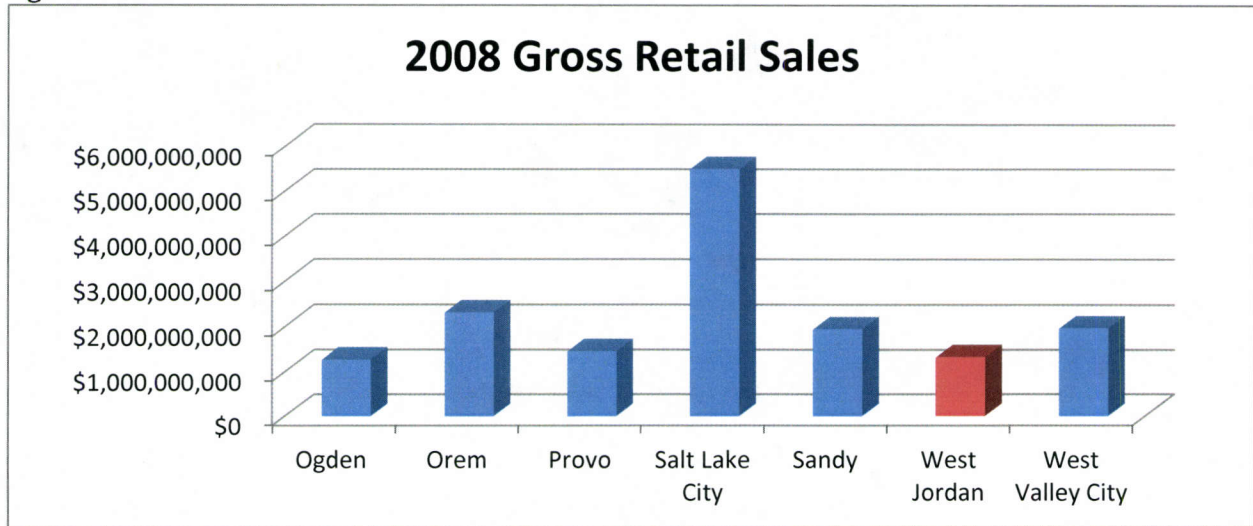
Economy

Gross retail sales for selected cities in 2008 are shown in Figure 1.5.11, and the gross retail sales based on a per capita basis are shown in Figure 1.5.12. In each case, West Jordan is second to last in the amount of gross retail sales. Despite its relatively low overall total, West Jordan's

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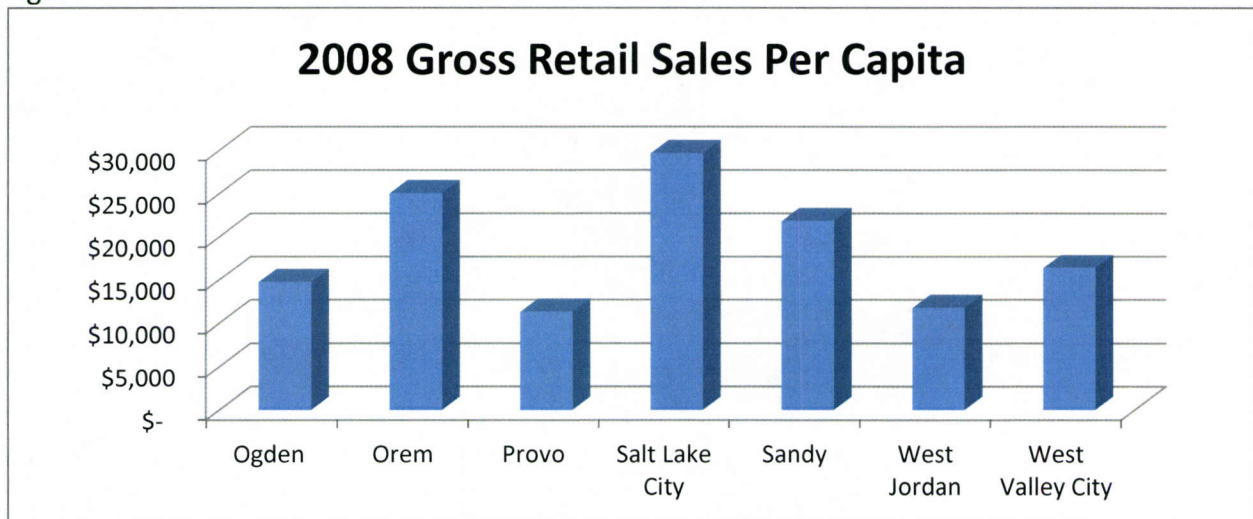
retail growth since 1996 has been very strong, expanding at an average annual rate of 10.3%. This growth has more than tripled the gross retail volume in the 12-year period from 1996 to 2008 (Figure 1.5.13). The majority of retail sales within the city are in the retail trade and business investment sectors (Figure 1.5.14).

Figure 1.5.11



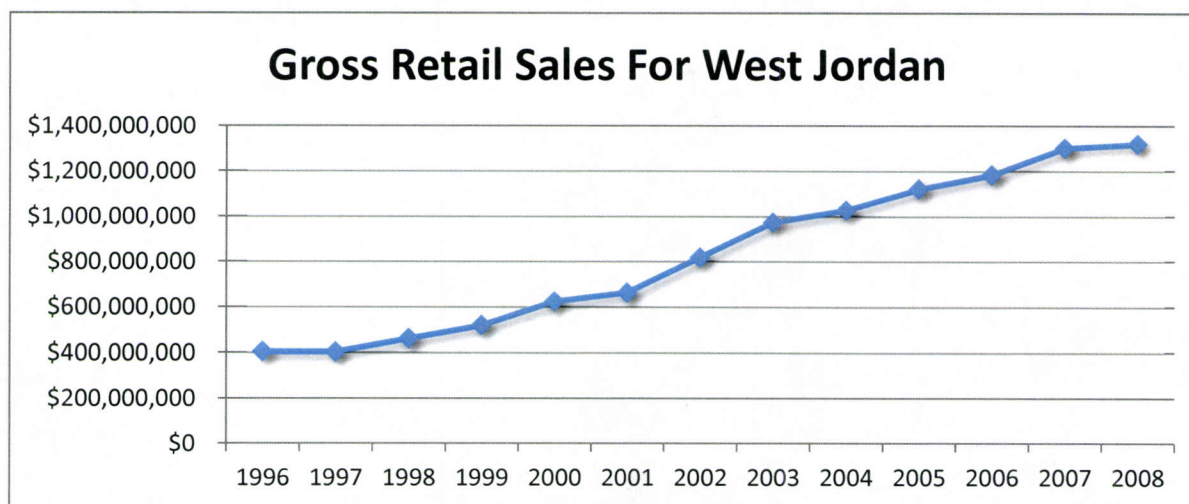
Source: Utah State Tax Commission, U.S. Census Bureau (2008)

Figure 1.5.12



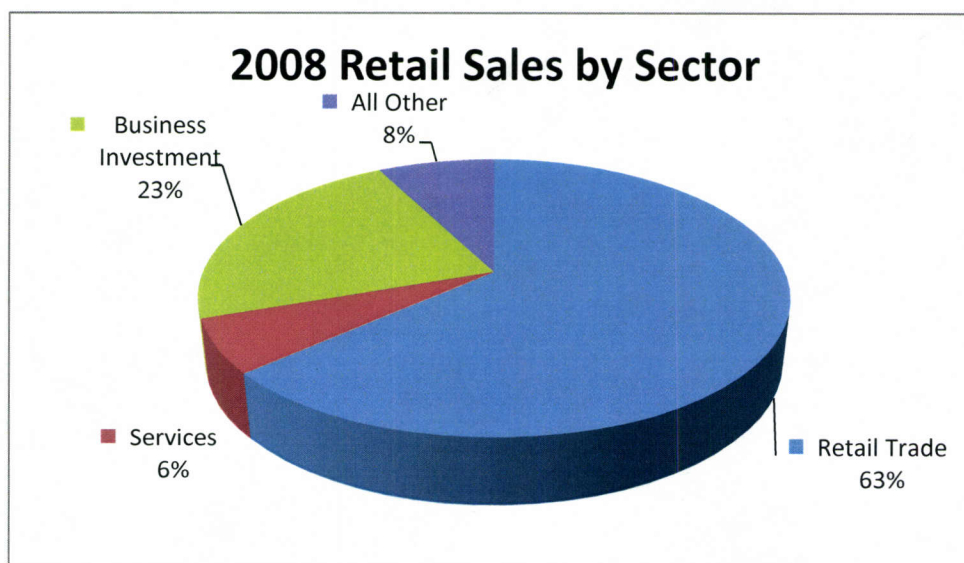
Source: Utah State Tax Commission (2008)

Figure 1.5.13



Source: Utah State Tax Commission (2008)

Figure 1.5.14



Source: Utah State Tax Commission (2008)

The largest sales tax payers in the city are shown in Figure 1.5.15, and the largest property tax payers are listed in Figure 1.5.16. While a large majority of the largest sales tax payers are large retail businesses, the composition of the property tax payers is more diverse, and includes industrial, retail, office, and property management companies.

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Figure 1.5.15 Principal Tax Payers

Taxpayer (Listed Alphabetically)	Industry
Lowe's	Home Improvement
Macey's	Grocery
Rocky Mountain Power	Utility
Sam's Club	Discount Retail
SME Industries	Construction
Smith's	Grocery
Sysco Foods	Distribution
Target	Discount Retail
The Home Depot	Home Improvement
Wal-Mart Stores	Discount Retail

Source: West Jordan Finance Department

Figure 1.5.16 Principal Property Tax Payers

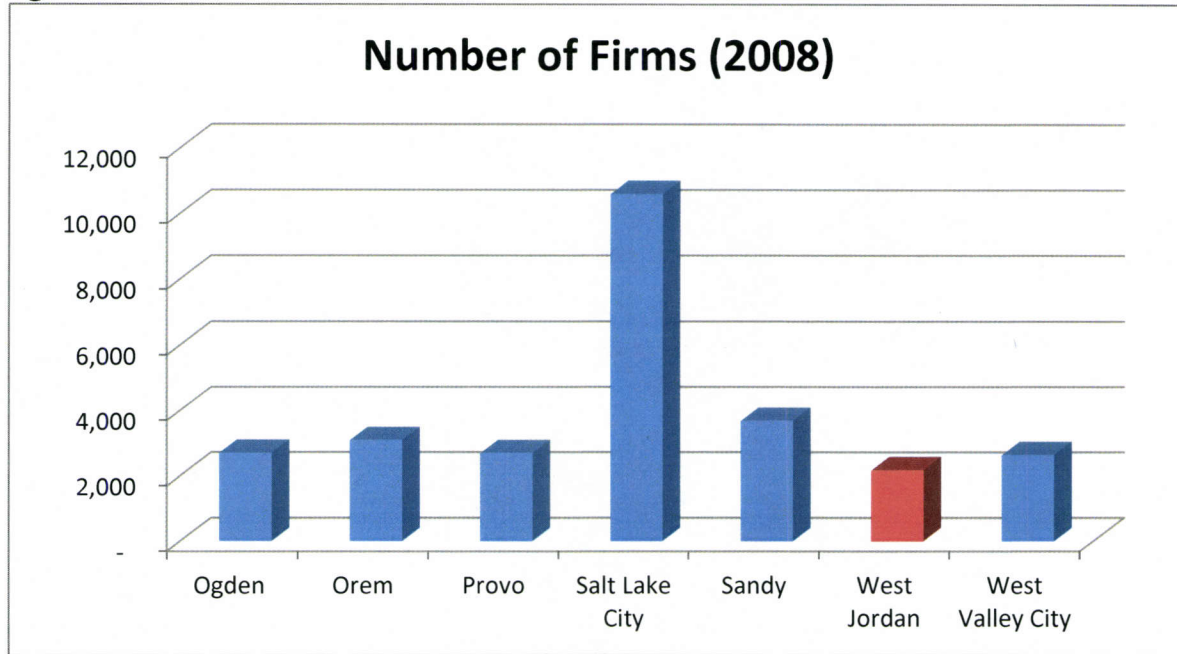
Taxpayer	Assessed Valuation	Rank	Percentage of Total Valuation
Jordan Landing LLC	\$127,014,300	1	2.41
Masco Cabinet Group LLC	58,806,600	2	1.12
CHC Jordan Valley Inc.	31,026,200	3	0.59
WRI West Jordan LLC	26,616,600	4	0.51
Willowcove Intntl. LLC	26,098,710	5	0.50
Mtn. America Credit Union	23,598,800	6	0.45
Dannon Company Inc.	21,647,000	7	0.41
Wal-Mart Stores, Inc.	19,593,300	8	0.37
SYSCO Foods	17,775,100	9	0.34
Grand Central Inc.	16,281,400	10	0.31

Source: West Jordan Finance Department (2010)

Businesses

Figure 1.5.17 shows the number of businesses in West Jordan compared to other cities along the Wasatch Front. In 2008, 2,168 businesses in West Jordan employed 28,907 persons. West Jordan's largest employers for 2008 and their approximate numbers of employees are shown in Figure 1.5.18. As shown in Figure 1.5.19, which illustrates the major categories of businesses in West Jordan, approximately 70% of the businesses in West Jordan are concentrated in the construction, financial, professional and business services, trade, transportation, and utilities sectors.

Figure 1.5.17



Source: Utah Department of Workforce Services (2008)

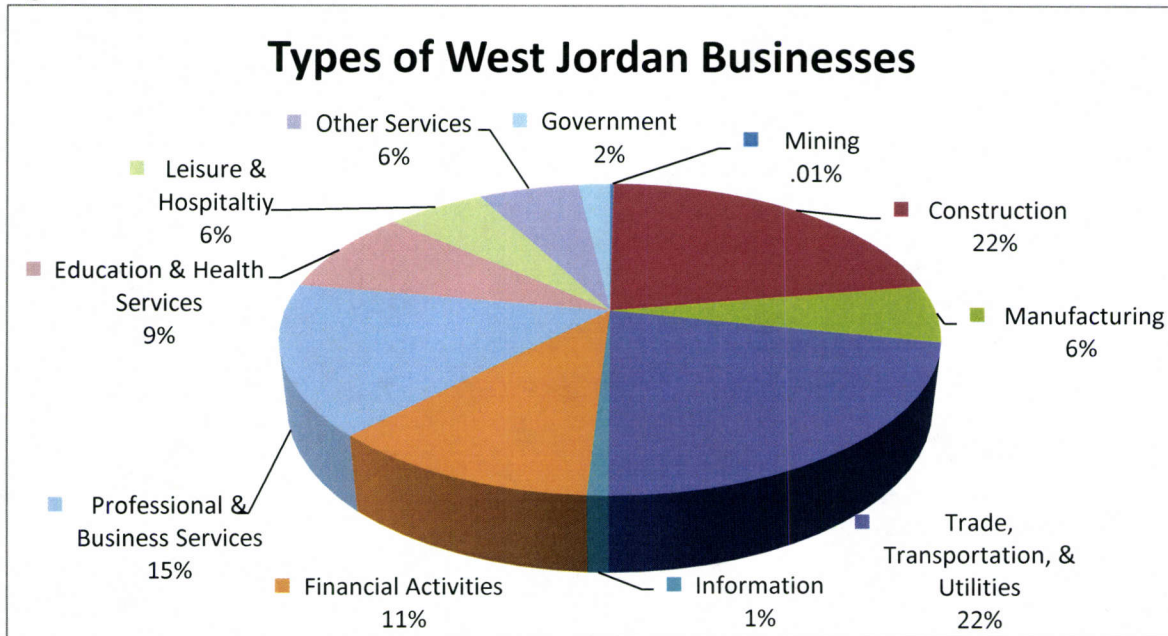
Figure 1.55.18 West Jordan's Largest Employers

Employer	Industry	Employees
Jordan Valley School District	Government	3,588
Utah Army National Guard	Government	777
Jordan Valley Medical Center	Health Services	656
Wal-Mart Stores	Discount Retail Trade	581
Fairchild Semiconductor	Manufacturing	575
City of West Jordan	Government	564
SYSCO Intermountain Food Services	Distribution	463
SME Industries	Construction	375
Mountain America Credit Union	Financial Services	327
Copper Hills Youth Center	Education	260

Source: West Jordan Division of Business Licensing

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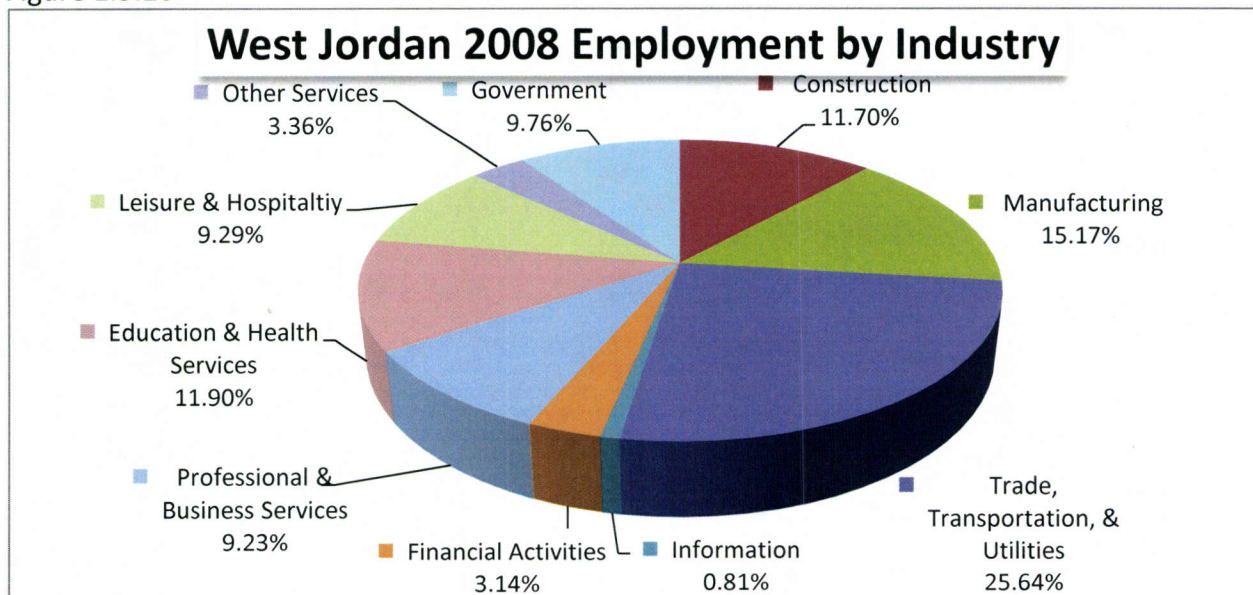
Figure 1.5.19



Source: Utah Department of Workforce Services

The major employment sectors in 2008 were trade, transportation, and utilities, which employed 26% of the workforce; manufacturing, which employed 15%; construction, which employed 12%; education and health services, which employed 12%; and government, which employed 10% of the workforce (see Figure 1.5.20).

Figure 1.5.20



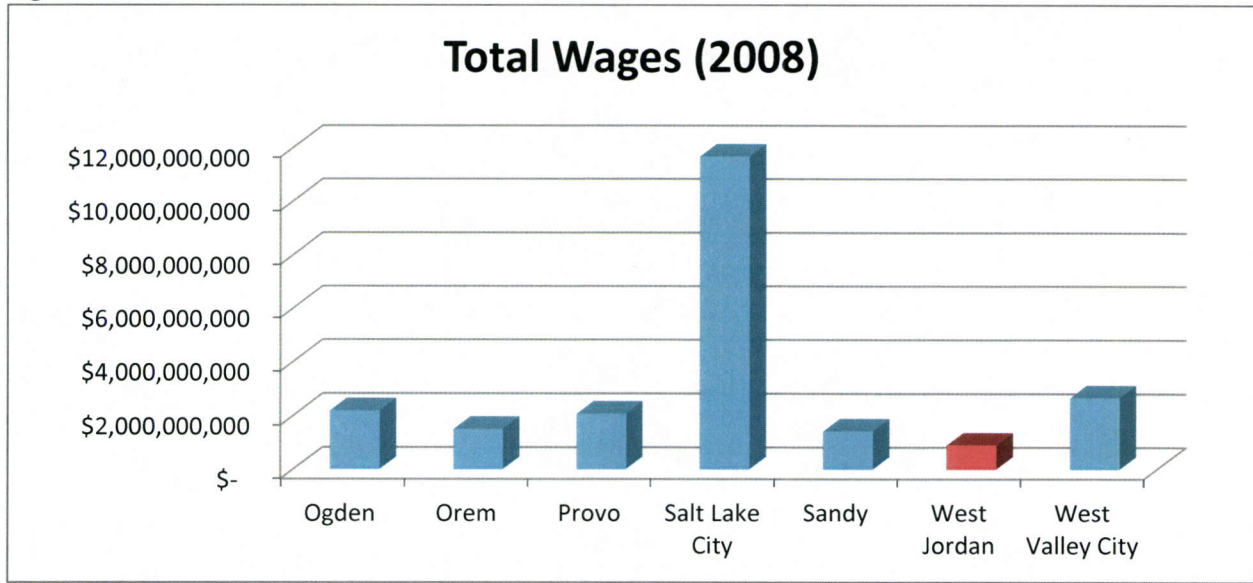
Source: Utah Department of Workforce Services (2008)

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Wages

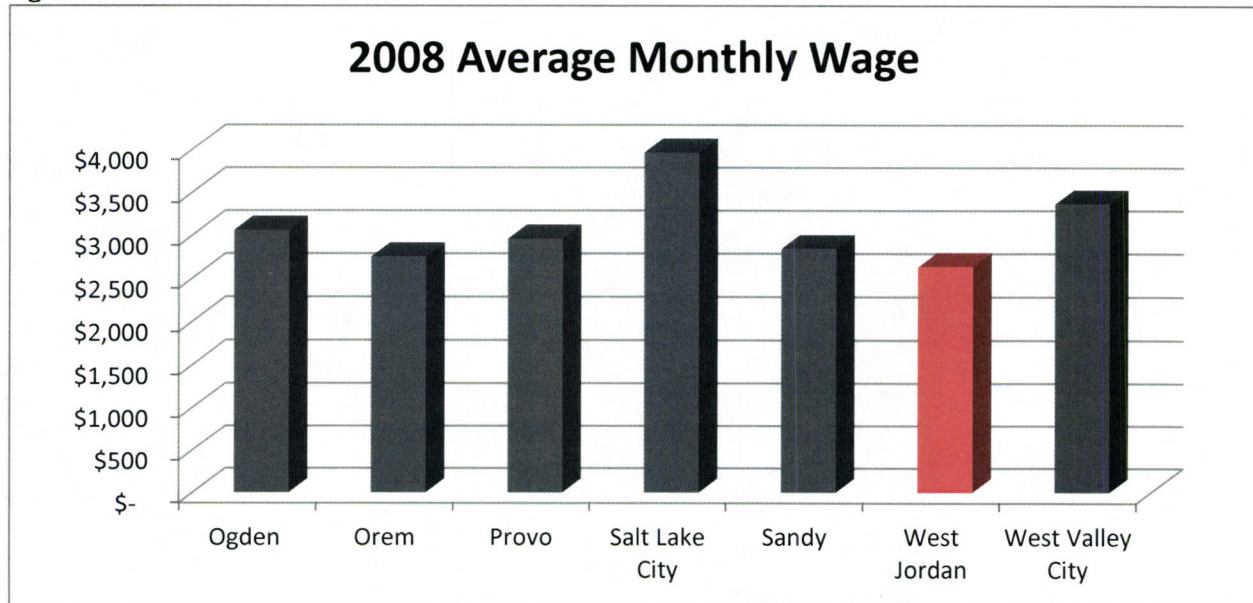
Total wages paid by employers in various cities are shown in Figure 1.5.21 below. Due to the small number of people employed in the city, West Jordan trails the other cities by a significant amount. However, in examining the average wage, West Jordan is more competitive, although still in last place (See Figure 1.5.22).

Figure 1.5.21



Source: Utah Department of Workforce Services (2008)

Figure 1.5.22



Source: Utah Department of Workforce Services (2008)

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An examination of the monthly wage by industry for West Jordan shows that the most lucrative jobs are in the construction, financial, government, manufacturing, and mining industries. The fields with the lowest average salary include information, and leisure & hospitality (see Figure 1.5.23).

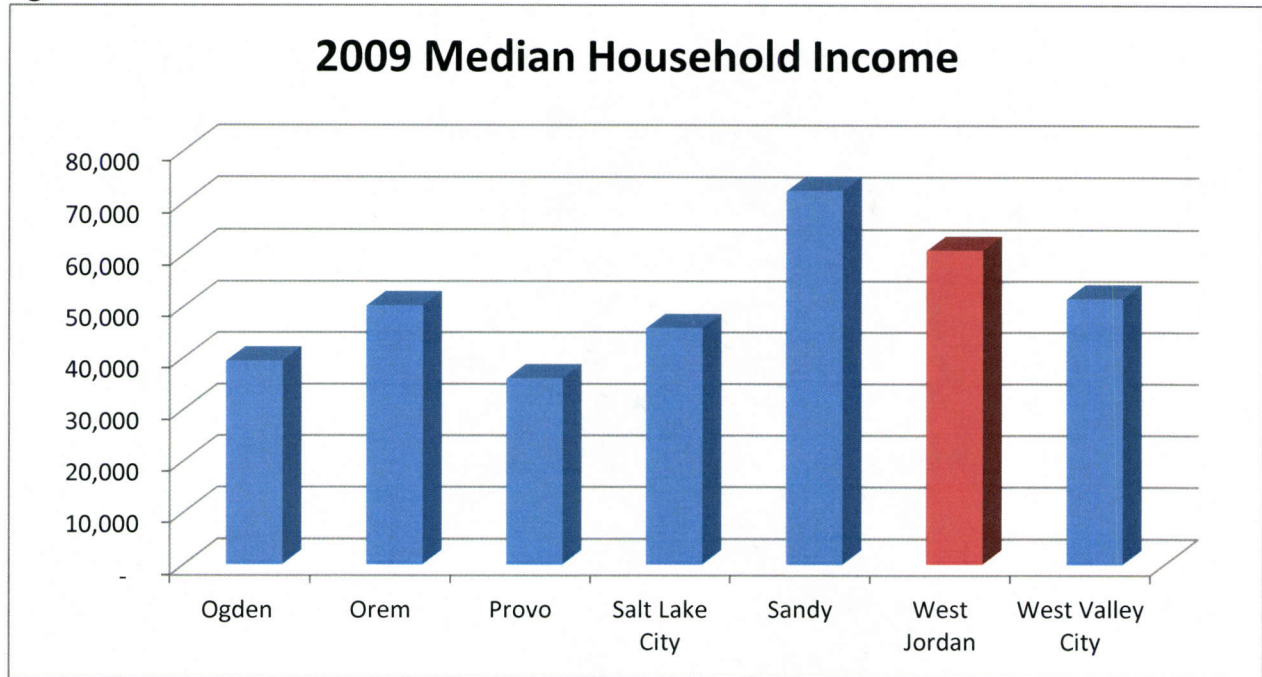
Figure 1.5.23



Source: Utah Department of Workforce Services (2009)

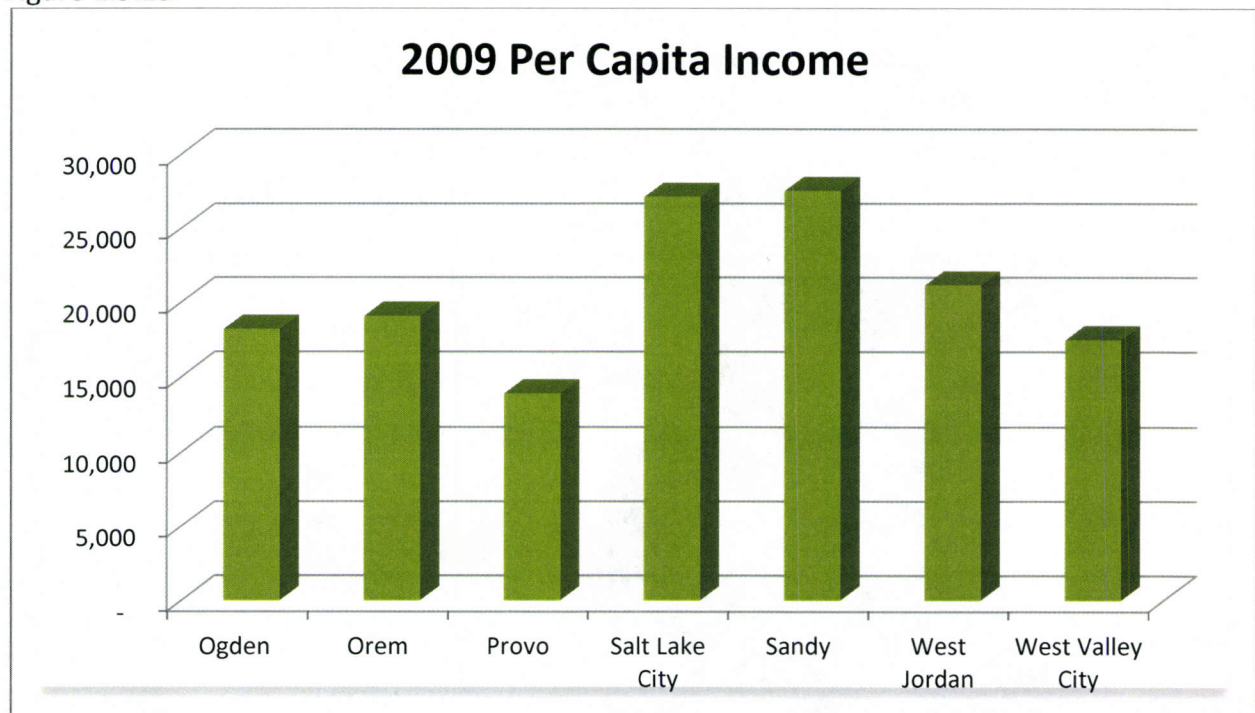
West Jordan enjoys one of the largest median household incomes of the cities listed in Figure 1.5.24. On a per capita basis, West Jordan maintains a high level of income compared to other cities, as evidenced in Figure 1.5.25. Due to this, the overall poverty rate in the city is comparatively lower than most other large cities in Utah (see Figure 1.5.26).

Figure 1.5.24



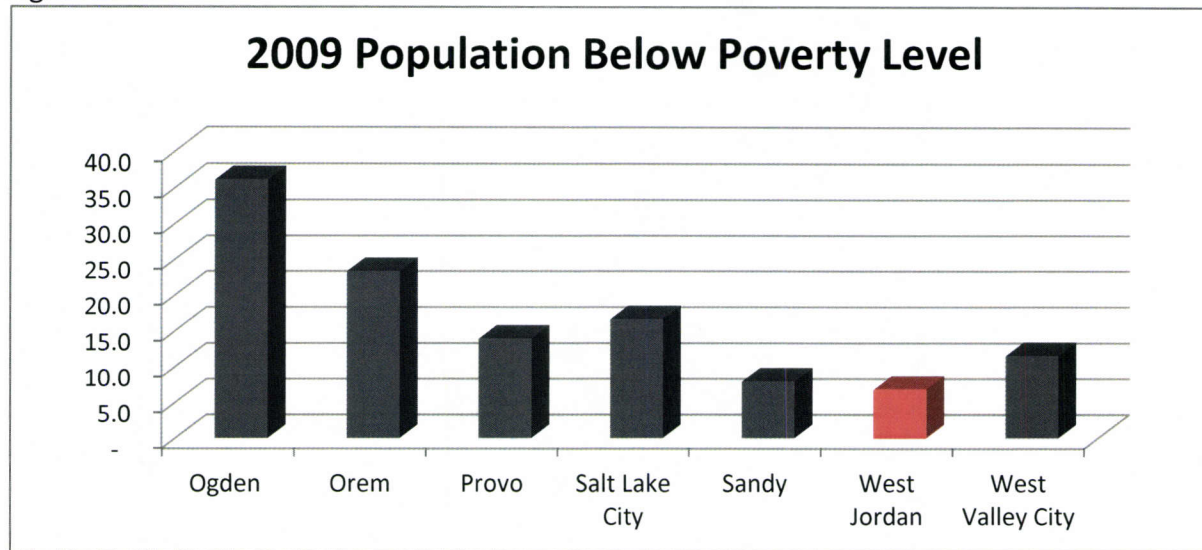
Source: U.S. Census Bureau (2009)

Figure 1.5.25



Source: U.S. Census Bureau (2009)

Figure 1.5.26



Source U.S. Census Bureau (2009)

Q.2 Hazard Identification and Summary

Q.2.1 Introduction

Identifying the hazards is the first step in any effort to prepare for, respond to, recovery from and engage in activities to reduce community vulnerability through mitigation. The hazard analysis involves identifying all of the hazards that potentially threaten the community and analyzing them individually to determine the degree of threat that is posed by each. The hazard analysis determines; what hazards can occur, how often they are likely to occur, how severe the situation is likely to get, how these hazards are likely to affect the community, and how vulnerable the community is to the hazard.

This information in this hazard analysis should be used as part of the basis for the development of emergency response and operations plans, mitigation plans, and recovery plans. It indicates which hazards merit special attention, what actions might be necessary to reduce the impact of those hazards, and what resources are likely to be needed.

Hazard analysis and risk assessment includes the completion of five steps:

1. Identifying the hazard.
2. Creating a profile of each hazard.
3. Develop a community profile.
4. Compare and prioritize risk.
5. Create and apply scenarios.

Q.2.2 Hazard Identification

A community hazard analysis considers all types of hazards. Categories of hazards include natural hazards, such as storms and seismological events, and technological or “man-made” hazards, such as an incident at a nuclear power plant, failure of oil or gas pipelines and other accidents at hazardous materials facilities. Some hazards may be the result of civil or political issues such as a neighborhood that has been the scene of rioting or large demonstrations. Cascading emergencies, or situations when one hazard triggers others in a cascading fashion, are also considered. For example, an earthquake that ruptured natural gas pipelines could result in fires and explosions that dramatically escalate the type and magnitude of events.

The following is a list of the hazards that have occurred, or could potentially occur, in the City of West Jordan. Identified hazards in West Jordan include both naturally occurring and “man-made” events:

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Natural Hazards

- Floods
- Earthquakes
- Wildfire
- Drought
- Pandemics/Epidemics
- Severe Weather
 - Winter Storms
 - Thunderstorms
 - Tornadoes
 - High winds / Microburst

Technological & “Man Made” Hazards

- Hazardous Materials incidents
- Power Outages
- Fallen Aircraft
- Terrorism / Criminal Acts
- Civil Disturbance
- Dam Failure
- Railway / Transportation

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Q.2.3 Hazard Profiles

For each hazard identified in South Jordan, a hazard profile has been created which includes some basic information about the hazard, historic and past occurrences and the following information for each:

- **Frequency of occurrence** - how often it is likely to occur. Frequency has been separated into four categories:

Highly Likely – nearly 100% probability in the next year.

Likely - Between 10 and 100% probability in the next one year, or at least one chance in 10 years.

Possible - Between 1 and 10% probability in the next one year, or at least one chance in 100 years

Unlikely – Less than 1% probability in the next 100 years.

- **Magnitude and potential intensity** - how bad it can get. Magnitude has been separated into four categories:

Catastrophic – Affects more than 50% of the community.

Critical – Affects between 25% and 50% of the community.

Limited – Affects between 10% and 25% of the community.

Negligible – Affects less than 10% of the community.

- **Location** - where in the community this hazard is most likely to occur and the probable spatial extent or how large an area it is likely to affect.
- **Duration** - how long the initial event or occurrence can be expected to last.
- **Seasonal pattern** -the time of year during which it is more likely to occur.
- **Speed of onset** -how fast it is likely to occur. Speed of onset has been separated into four categories:

Minimal or no warning

6 to 12 hours warning

12 to 24 hours warning

More than 24 hours warning

- **Availability of warnings** - how much warning time there is, and whether a warning system exists.

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Q.2.3.1 Floods

Floods are one of the most common types of hazards in the world and can occur almost anywhere. Flood effects can be local, impacting a neighborhood or community, or very large, affecting entire river basins over a large area. They are often associated with, or triggered by, other disaster events such as severe weather and dam failures. Flooding is defined as the temporary inundation of normally dry land areas.

Not all floods are the same. Some develop slowly over time, maybe days or weeks, while others occur with little or no warning. Flash floods often have a dangerous wall of roaring water that carries rocks, mud, and other debris and can sweep away most things in its path. Overland flooding occurs outside a defined river or stream, such as when a levee is breached, but still can be destructive. Flooding can also occur when a dam breaks, large pipes, canals, or other infrastructure that contain or convey water for irrigation or culinary purposes fail, producing effects similar to flash floods.

Several different types of flooding are possible and can be expected in South Jordan and include; riverine, flash flood, infrastructure failure including dam failure, urban drainage and subsurface drainage. The Federal Emergency Management Agency in conjunction with the National Flood Insurance Agency has mapped areas of special flood hazards in South Jordan on the Flood Insurance Rate Maps for Salt Lake County. These maps show areas likely to be inundated by the base flood, or “100 year flood”.

Frequency of Occurrence:	POSSIBLE. Between 1 and 10% probability in next year, or at least one chance in the next 100 years
Magnitude:	LIMITED - 10 – 25%
Location:	Riverine flooding can be expected along the Jordan River, Bingham Creek and historic wash areas from the Oquirrh Mountains. There are five canals that traverse West Jordan from south to north. One of those terminates in West Jordan. (North Jordan Canal, South Jordan Canal, Utah and Salt Lake Canal, Utah Lake Distributing Canal and Provo Reservoir Canal.) Localized floods and flash flooding are possible in all areas of the City. Subsurface flooding problems near the Jordan River and eastern portions of the city. See the FEMA Flood Insurance Rate Map for details on other known mapped special flood hazard areas
Duration:	May last hours or days. Extended periods of flooding may last a week or more in some areas.
Seasonal Pattern:	Flooding may occur at any time from infrastructure or dam failure. Flooding caused by rapid snowmelt will most likely will occur in late spring and early summer. Heavy rain or seasonal thunderstorms may occur in the spring and late summer months creating possible riverine or flash flooding.

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Speed of Onset:	12 to 24 hours warning; may occur with little or no warning.
Availability of Warnings:	None. Monitoring of conditions may give some advanced notice. The National Weather Service sometimes issues flood watches and warnings.
Historic Events in West Jordan:	
August 2014 –	17 homes were flooded when rainfall runoff overwhelmed storm water capability.
August 2013 -	An apartment complex in the southwest portion of the city sustain a river of mud from accumulate flow across the dry farm areas to the west.

Q.2.3.2 Earthquakes

An earthquake occurs when there is sudden movement between blocks of rock along a break in the earth's crust. Utah has a significant risk for earthquakes. There are hundreds of earthquakes each year in Utah. While most of these earthquakes are small events, there are a few large enough quakes each year that are felt by humans (about 2%). Earthquakes with a magnitude 5.5 to 6.5 occur about every 4 to 5 years in Utah and the potential exists along the Wasatch Front for earthquakes with a magnitude of up to 7.0 – 7.5 to occur.

Ground shaking is the most damaging and widespread geologic hazard caused by an earthquake and induces many of the other geologic hazards. All areas of South Jordan are susceptible to the effects of ground shaking. Property damage may occur to man-made structures such as buildings, highways, bridges, dams, utility lines and falling objects may cause injuries.

Besides ground shaking, earthquakes may also trigger other geologic hazards such as liquefaction, surface fault rupture, rock falls, landslides and slope failures and sometimes flooding. Liquefaction occurs when loose, wet soils react to ground shaking from large earthquakes (magnitude 5.0 or greater) and act like a thick liquid and become incapable of supporting buildings or other infrastructure. Areas of high liquefaction are located in South Jordan, especially in the eastern half of the city and near the Jordan River. Surface fault rupture may occur in the area near the fault zone and may range from a few inches to as much as twenty feet. The resulting “crack” may be a few hundred feet to several miles long. Surface fault rupture in South Jordan is not likely based on the distance from the Wasatch Fault Zone. Based on its local geography, rock falls, landslides and slope failures would be rare in South Jordan.

Geologic hazards can occur from an earthquake that occurs from more than 100 miles away. When evaluating the potential risk from earthquake hazards it is important to consider the following;

- The size (or magnitude) of the event and the distance from where it occurs
- The local geology such as the underlying rock type, soil cover and ground water conditions
- Any of the geologic hazards that might result from ground shaking (liquefaction, landslides, etc.)
- The location of, design, and construction methods of man-made structures and utility systems

While no one knows when the next large earthquake in Utah will occur, many researchers and scientists believe that we are “over-due” for a major event based on historic evidence in the geologic record.

Since the mid 1800's, two largest earthquakes in Utah occurred in Hansel Valley in 1934 (magnitude 6.6) and near Richfield in 1901 (magnitude 6.5). The two most damaging events in

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Utah occurred in 1962 near Richmond in the Cache Valley (magnitude 5.7) and St. George in 1992 (magnitude 5.8).

Frequency of Occurrence:	POSSIBLE - Between 1 and 10% probability in next year, or at least one chance in the next 100 years
Magnitude:	CATASTROPHIC - More than 50%
Location:	The entire city is at risk for ground shaking. Certain areas are at risk for liquefaction (see map). It does not appear that there is a significant chance for surface rupture.
Duration:	Initial Ground Shaking may last for a few seconds or nearly a minute or more. The primary event will most likely be followed by aftershocks for hours, days, weeks and possibly months.
Seasonal Pattern:	There is no seasonal pattern associated with this hazard. Could occur at any time.
Speed of Onset:	Minimal or no warning
Availability of Warnings:	None.
Historic Events in West Jordan:	

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Q.2.3.3 Wildfire

Wildfire is an uncontrolled fire spreading through vegetative fuels, exposing and possibly consuming structures. They often begin unnoticed and spread quickly and are usually signaled by dense smoke that fills the area for miles around.

A wildland fire is a wildfire in an area in which development is essentially nonexistent, except for roads, railroads, power lines and similar facilities. An urban-wildland interface fire is a wildfire in a geographical area where structures and other human development meet or intermingle with the wildland or vegetative fuels.

South Jordan does have some urban-wildland interface along the Jordan River and the western portions of the city.

Frequency of Occurrence:	POSSIBLE - Between 1 and 10% probability in next year, or at least one chance in the next 100 years
Magnitude:	NEGLIGIBLE - Less than 10%
Location:	Undeveloped areas along the Jordan River where natural vegetation is abundant. Other undeveloped areas, open areas, some agricultural areas. See map for further information.
Duration:	Hours to days.
Seasonal Pattern:	Most likely to occur mid-summer through late fall.
Speed of Onset:	Minimal or no warning
Availability of Warnings:	None. Some factors may be observed that indicate the potential is higher.
Historic Events in West Jordan:	

Most events have been small grass and brush fires. No significant events have occurred.

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Q.2.3.4 Drought

A drought is defined as "a period of abnormally dry weather sufficiently prolonged for the lack of water to cause serious hydrologic imbalance in the affected area." -Glossary of Meteorology (1959). Simply stated, a drought is a period of unusually persistent dry weather that persists long enough to cause serious problems such as crop damage and/or water supply shortages. The severity of the drought depends upon the degree of moisture deficiency, the duration, and the size of the affected area.

There are actually four different ways that drought can be defined.

<u>Meteorological</u>	A measure of departure of precipitation from normal. Due to climatic differences, what might be considered a drought in one location of the country may not be a drought in another location.
<u>Agricultural</u>	Refers to a situation where the amount of moisture in the soil no longer meets the needs of a particular crop.
<u>Hydrological</u>	Occurs when surface and subsurface water supplies are below normal.
<u>Socioeconomic</u>	Refers to the situation that occurs when physical water shortages begin to affect people.

Impacts of drought:

Lack of rainfall for an extended period of time can bring farmers and metropolitan areas to their knees. It does not take very long; in some locations of the country, a few rain-free weeks can spread panic and affect crops. Before long, we are told to stop washing our cars, cease watering the grass, and take other water conservation steps. In this situation, sunny weather is not always the best weather.

Here in the semi-arid desert climate in Utah, a few weeks without rain are not uncommon. However, when the weeks turn to months, serious problems can arise. Because of the fact that much of our drinking water comes from snowmelt, a dry winter can have serious implications in terms of how much water is available for the following summer season. Most locations have sufficient water reservoirs to make it through one dry winter. The real problem becomes back to back dry winter seasons.

Noticeable effects of drought in the area:

- Lowered water levels in reservoirs
- Lower flows in streams
- Fluctuation in levels of the Great Salt Lake
- Less water recharge in aquifers
- Increased demand for wells

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Frequency of Occurrence:	POSSIBLE - Between 1 and 10% probability in next year, or at least one chance in the next 100 years
Magnitude:	CRITICAL - 25 – 50 %
Location:	All areas of the community, may especially impact agricultural areas.
Duration:	Multiple years.
Seasonal Pattern:	Likely to occur in 3 to 10 year patterns.
Speed of Onset:	More than 24 hours warning
Availability of Warnings:	The National Weather Service Forecast Office monitors drought conditions around the country and makes forecasts and predictions regarding drought conditions.

Historic Events in West Jordan:

1999 – 2003	Statewide drought conditions
1988 – 1993	Statewide drought conditions
1974 – 1978	Statewide drought conditions
1953 – 1965	Statewide drought conditions
1930 – 1936	Statewide drought conditions
1896 – 1907	Statewide drought conditions

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Q.2.3.5 Pandemic

A pandemic is an outbreak of an infectious disease, also known as an epidemic, which spreads across a large region of the world. According to the World Health Organization there are three conditions that must be met in order for a pandemic to break out:

- The emergence of a disease new to the population
- The agent infects humans, causing serious illness
- The agent spreads easily and sustainably among humans

The potential for disruption by pandemic is growing larger all the time as more worldwide travel and commerce become common. While it is difficult to predict the magnitude that such an event may have on human activity, there are some scenarios that can be anticipated. Such an event may lead to increased absenteeism for schools and businesses, interruption of services and deliveries, fear, panic, and death.

Frequency of Occurrence:	POSSIBLE - Between 1 and 10% probability in next year, or at least one chance in the next 100 years
Magnitude:	CRITICAL - 25 – 50 %
Location:	All areas of the community.
Duration:	Weeks to months.
Seasonal Pattern:	There is no seasonal pattern associated with this hazard. Could occur at any time. Some events may be likely to occur during the period between late fall and early spring when people are more likely to be indoors and in closer contact with each other.
Speed of Onset:	More than 24 hours warning
Availability of Warnings:	U.S. Center for Disease Control may issue warnings and advisories. Salt Lake Health Department may issue warnings and advisories.

Historic events around the world:

2009-2010	Swine Flu
2002-2003	SARS
1960's	Hong Kong Flu
1950's	Asian Flu
1918	"Spanish Flu" (or avian flu)
1300's	Black Plague or "Black Death"
165-180 AD	Antonine Plague

Multi-Hazard Mitigation Plan

Q.2.3.6 Severe Weather

Utah is well known for its rapid and often severe changes in weather. Severe weather includes; winter storms, large scale wind events, thunderstorms, lightning, hail, tornadoes, flooding, and avalanches. While some types of these events can be predicted, others will occur with little or no warning.

Winter Storms

Known for some of the greatest snow on earth, Utah can receive from several inches to several feet of snow in a single storm event. Snowfall is often influenced by the Great Salt Lake which produces localized bands of snowfall and can produce some of the area's most severe winter storms.

Severe winter storms can significantly impact transportation routes and pose logistical problems with snow removal during prolonged events. Heavy accumulations of snow can lead to property damage, power outages, and force people to stay in their homes for lengthy periods of time. Air temperatures following the days after a winter storm can become very cold leading to other concerns for people out of power or heat sources.

Frequency of Occurrence:	LIKELY - Between 10 and 100% probability in next one year, or at least one chance in ten years
Magnitude:	CATASTROPHIC - More than 50%
Location:	The entire city is subject to this type of event, although its effects and severity may vary from one location to another.
Duration:	From hours to days. Effects of the storms may last up to a week.
Seasonal Pattern:	Most likely to occur from late fall through spring. May occur day or night.
Speed of Onset:	12 to 24 hours warning
Availability of Warnings:	The National Weather Service issues Watches, Warnings and Advisories.
Historic Events in West Jordan:	

Multi-Hazard Mitigation Plan

Thunderstorms

Thunderstorms occur in South Jordan on an annual basis. Sometimes the intensity of these storms can cause them to be quite destructive to property, create flash floods, and interrupt power services.

Thunderstorms usually affect relatively small areas when compared to other types of disasters. Despite their small size, all thunderstorms are dangerous. They can be the source for other weather related hazards such as tornadoes, lightning, hail, flash floods, and strong winds.

A typical thunderstorm is 15 miles in diameter and lasts about 30 minutes. Of the estimated 100,000 thunderstorms that occur in the United States each year, about 105 are classified as severe. All thunderstorms need three things; moisture to form clouds and rain, unstable air (warm air that can rise rapidly), and something that is capable of lifting air, such as a warm or cold front, mountains or the sun's heat.

Frequency of Occurrence:	HIGHLY LIKELY - Near 100% Probability in the next year
Magnitude:	NEGLIGIBLE - Less than 10%
Location:	The entire city is subject to this type of event, although its effects and severity may vary from one location to another.
Duration:	From a few minutes to hours.
Seasonal Pattern:	Most likely to occur from late spring through early fall. Most common during the afternoon and evening hours. Very rare in winter.
Speed of Onset:	6 to 12 hours warning
Availability of Warnings:	The National Weather Service issues Watches and Warnings.
Historic Events in West Jordan:	

Multi-Hazard Mitigation Plan

Tornado

A tornado is a violently rotating column of air extending from a thunderstorm to the ground. Tornadoes are caused by thunderstorms when cold air overrides a layer of warm air, causing the warm air to rise rapidly. The most violent tornadoes are capable of tremendous destruction with wind speeds of 250 mph or more. Damage paths can be in excess of 1 mile wide and 50 miles long. Tornadoes are among the most unpredictable of weather phenomena. While not very common in Utah, tornadoes have occurred in the Salt Lake valley.

Tornado Statistics for Utah;

Size of Tornadoes: Funnel diameter is usually 10 to 20 yards wide. Largest reported funnel diameters: 440 yards wide on December 2, 1970; 800 feet wide on September 8, 2002; 200 yards wide on May 30, 1986 and August 30, 1992; 100 to 200 yards wide on August 11, 1999; and 100 yards wide on May 6, 1981 and July 25, 1991.

Duration of Tornadoes: Usually only a few seconds to a few minutes. Greatest amount of time on the ground: 15 minutes on July 9, 1962, July 25, 1991, August 30, 1992, July 24, 1998 and September 8, 2002.

Color of Tornadoes: Usual color- gray or brown. Other colors: black on July 9, 1962; red on July 24, 1981; and white on December 2, 1970 and March 29, 1982. Tornado Statistics for Utah: January 1950 to the Present

Since 1950 there have been 123 confirmed tornadoes in Utah, 15 of those have occurred in Salt Lake County. Stated monetary damage from all 123 tornadoes is \$173,011,200+. Generally these tornadoes have not been severe, but at least 7 of them have been classified as F2 on the Fujita Intensity Scale, or F-scale, which is used to rate tornado intensity. One tornado, occurring in the Uinta Mountains in August 1993 was classified as a F3.

Tornado occurrence by month in Utah 1950 - 2006:

January	1	July	14
February	1	August	24
March	4	September	21
April	7	October	0
May	29	November	2
June	18	December	2

For more detailed information and statistics see the National Weather Service website at: <http://newweb.wrh.noaa.gov/slc/climate/tornado.php> (as of 27 Feb 2012)

Multi-Hazard Mitigation Plan

Frequency of Occurrence:	POSSIBLE - Between 1 and 10% probability in next year, or at least one chance in the next 100 years
Magnitude:	LIMITED - 10 – 25%
Location:	The entire city is subject to this type of event, although its effects and severity may vary from one location to another.
Duration:	Actual tornado may only be active for a few minutes, but the associated storm may last for hours.
Seasonal Pattern:	Most likely to occur from late spring through early fall. Most common during the afternoon and evening hours. Very rare in winter.
Speed of Onset:	Minimal or no warning
Availability of Warnings:	The National Weather Service issues Watches and Warnings.

Historic Events in the area near South Jordan:

1965 - February 9	A tornado that developed ahead of a cold front in Magna, Salt Lake County.
1968 - August 14	A tornado moved through downtown Salt Lake City.
1986 - September 9	A tornado was spotted in a field in the Kearns area of the Salt Lake Valley. It lasted for a minute and did no damage.
1989 - January 10	A tornado produced a fair amount of damage to a south Sandy neighborhood during the morning hours of January 10, 1989.
1989 - March 2	A tornado touched down near 3699 South and 7500 West.
1989 - July 8	Strong microburst winds and a tornado hit the Midvale area just west of 1-15 at about 7200 South.
1990 - August 16	A tornado was sighted along Interstate 80 in Magna by a motorist. It briefly touched down then dissipated. There were no injuries of damage.
1992 - August 30	On the afternoon of August 30, a tornado was spotted by a number of people in the southwestern part of the valley near Kennecott Mines.
1998 - May 8	At about 4:15 PM, a weak tornado (rated FO) was reported in West Valley City.
1998 - July 24	A tornado touched down over the old Kennecott dumping grounds south of Copperton.
1999 - August 11	Tornado in Salt Lake City, killed 1 person, 100+ persons injured. 300 buildings damaged, 34 homes left uninhabitable. Wide spread power outages, significant debris, estimated costs at over 170 million.
2000 - May 25	A small tornado (FO) was observed in the Holladay area with a funnel cloud and possible touchdown earlier in West Jordan and Murray. Total damage was estimated at about \$100,000.
2001 - August 21	A weak (FO) tornado briefly touched down in the Sugarhouse area.

Multi-Hazard Mitigation Plan

Microburst / High Winds

Frequency of Occurrence:	LIKELY - Between 10 and 100% probability in next one year, or at least one chance in ten years
Magnitude:	CATASTROPHIC - More than 50%
Location:	The entire city is subject to this type of event, although its effects and severity may vary from one location to another.
Duration:	From hours to days. Effects of the storms may last up to a week.
Seasonal Pattern:	Most likely to occur from late fall through spring. May occur day or night.
Speed of Onset:	12 to 24 hours warning
Availability of Warnings:	The National Weather Service issues Watches, Warnings and Advisories.
Historic Events in West Jordan:	
High Wind Event - August 2013	60 large electrical transmission poles were toppled along SR-111

** One weather related phenomenon that occurs that should be noted is that of weather related inversions. These inversions tend to occur most often in the months of December, January and February when pockets of cold air become trapped in the valley between the Oquirrh Mountain range and the Wasatch Mountain range. These temporary inversions can last several days and lead to poor air quality for residents in the valley and restrictions placed on burning some types of fuels.

Multi-Hazard Mitigation Plan

Q.2.3.12 Dam Failure

The largest dam located in West Jordan is the Bateman Pond dam located at 6800 South 1100 West. Other dams that are listed with the State of Utah are all dams created by the construction of water detention basins that meet individual planning requirements.

Frequency of Occurrence:	POSSIBLE - Between 1 and 10% probability in next year, or at least one chance in the next 100 years
Magnitude:	LIMITED - 10 – 25%
Location:	Area of potential inundation identified in the Oquirrh Lake Dam Emergency Action Plan
Duration:	Hours.
Seasonal Pattern:	There is no seasonal pattern associated with this hazard. Failure could occur at any time.
Speed of Onset:	12 to 24 hours warning
Availability of Warnings:	None.
Historic Events in South Jordan:	None.

Multi-Hazard Mitigation Plan

Q.3 Vulnerability & Risk Assessment

The vulnerability assessment applies the information collected through hazard identification and profiling to our community's assets to summarize the impacts from hazards on the community and its vulnerable structures. These impacts are represented by measures such as population at risk, percent damages, and dollar loss estimation. Information provided by the vulnerability assessment includes the areas of our community that are susceptible to each hazard and the areas where the highest losses could occur. This type of information will provide a factual basis for developing effective mitigation strategies.

The primary objective of the vulnerability assessment is to prioritize hazards of concern for our community so that a framework for mitigation strategy and policy development is established.

Q.3.1 Critical Facilities and Infrastructure

A critical facility may be defined as one that is essential in providing utility or direction either during the response to an emergency or during the recovery operation. Essential facilities are those that if damaged would have devastating impacts on disaster response and recovery. High potential loss facilities are those that would have a high loss or impact on the community. Transportation and lifeline facilities are the third category.

Q.3.1.1 Essential Facilities at Risk (City, County or State Owned)

Facility	Location	Function
City Hall	8000 S. Redwood Road	City Administration
West Jordan Justice Center	8040 S. Redwood Road	Police Department and Justice Court
Fire Station 52	7959 S. Redwood Road	Fire / EMS / Hazmat/Heavy Rescue
Fire Station 53	7602 S. Jordan Landing Boulevard	Fire / EMS / Hazmat/Heavy Rescue/Admin
Fire Station 54	9351 S. 5595 W.	Fire / EMS / Hazmat/Heavy Rescue
Fire Station 55	7750 S. 6400 W.	Fire / EMS / Hazmat/Heavy Rescue
Public Works	8040 S. 4000 W.	Public Works
Animal Shelter	5982 New Bingham Highway	Animal Services
Gene Fullmer Recreation Center	8015 S. 2200 W.	Possible Sheltering Location
West Jordan Senior Center	8025 S. 2200 W.	Possible Sheltering Location
Utah 3 rd District Court	8080 S. Redwood Road	State of Utah District Court

Multi-Hazard Mitigation Plan

Q.3.1.2 Essential Facilities at Risk (Non-City Owned)

Facility	Location	Function
Columbia Elementary	3505 W. 7800 S.	Public School
Copper Canyon Elementary	8917 S. Copperwood Dr. (5600 W.)	Public School
Falcon Ridge Elementary	6111 W. 7000 S.	Public School
Fox Hollow Elementary	6020 W. 8020 S.	Public School
Hayden Peak Elementary	5120 W. Hayden Peak Dr. (7995 S.)	Public School
Heartland Elementary	1451 W. 7000 S.	Public School
Jordan Hills Elementary	8892 S. 4800 W.	Public School
Majestic Elementary	7430 S. Redwood Road (1700 W.)	Public School
Mountain Shadows Elementary	5255 W. 7000 S.	Public School
Oakrest Elementary	8462 S. Hilltop Oak Drive (6620 W.)	Public School
Oquirrh Elementary	7165 S. Paddington Road (3285 W.)	Public School
Riverside Elementary	8737 S. 1220 W.	Public School
Terra Linda Elementary	8400 S. 3400 W.	Public School
West Jordan Elementary	7220 S. 2370 W.	Public School
Westland Elementary	2925 W. 7180 S.	Public School
Westvale Elementary	2300 W. 8660 S.	Public School
Joel P. Jensen Middle	8105 S. 3200 W.	Public School / Shelter
Sunset Ridge Middle	8292 S. Skyline Arch Drive	Public School / Shelter
West Hills Middle	8270 S. Grizzly Road (5400 W.)	Public School / Shelter
West Jordan Middle	7550 S. Redwood Road (1700 W.)	Public School / Shelter
Copper Hills High	5445 W. New Bingham Hwy. (7800 S.)	Public School / Shelter
West Jordan High	8136 S. 2700 W.	Public School / Shelter
South Valley School	8400 S. Redwood Road (1700 W.)	Public Special Needs School
JATC	9301 S. Wights Fort Road (3400 W.)	Public Technical School
SLC Community College Jordan	3491 W. 9000 S.	Public School / Shelter

Multi-Hazard Mitigation Plan

Q.3.1.5 Risk Index Summary

HAZARD	MAGNITUDE	FREQUENCY	WARNING TIME	SEVERITY	SPECIAL CHARACTERISTICS AND PLANNING CONSIDERATIONS	RISK PRIORITY
Agricultural	Negligible	Possible	24 + hours	Limited	Agricultural areas are being reduced as homes are being built.	Low
Civil Disturbance	Negligible	Possible	Minimal	Limited	Most likely to occur at "major event" or as the result of political issues.	Low
Dam Failure	Limited	Possible	12-24 hours	Limited	The lake is still being built. Dam is owned by a private company.	Low
Drought	Likely	Catastrophic	24 + hours	Limited	Cyclic events. Severity and end of event uncertain.	Low
Earthquake	Catastrophic	Possible	None	Critical	Cannot be predicted. Scientists say that we are "overdue" for a large event in this area.	High
Fallen Aircraft	Negligible	Possible	Minimal	Negligible	Proximity to airports and flight paths makes this possible.	Low
Floods	Limited	Possible	12-24 hours	Limited	Flooding can occur in any part of the City for a variety of reasons	Low
Hazardous Materials Incident	Critical	Likely	Minimal	Limited	Areas near the interstate, railroad tracks and centers of manufacturing are at greatest risk.	High
Liquefaction	Critical	Possible	Minimal	Limited	Will be a cascading effect of an earthquake. Areas near the Jordan River are most at risk	Medium
Pandemic	Critical	Possible	24 + hours	Catastrophic	Could require restricting travel, commerce, schools, and other social issues	Medium
Power Outage	Catastrophic	Likely	Minimal	Limited	Depending on duration of the event, may cause many problems.	High
Severe Winter Weather	Catastrophic	Likely	12-24 hours	Limited	Occurs almost annually. May cause power outages as a cascading event.	High
Terrorism	Critical	Possible	Minimal	Negligible	There are few "targets" in the City, but it is still possible that malicious acts may occur for other reasons.	Medium

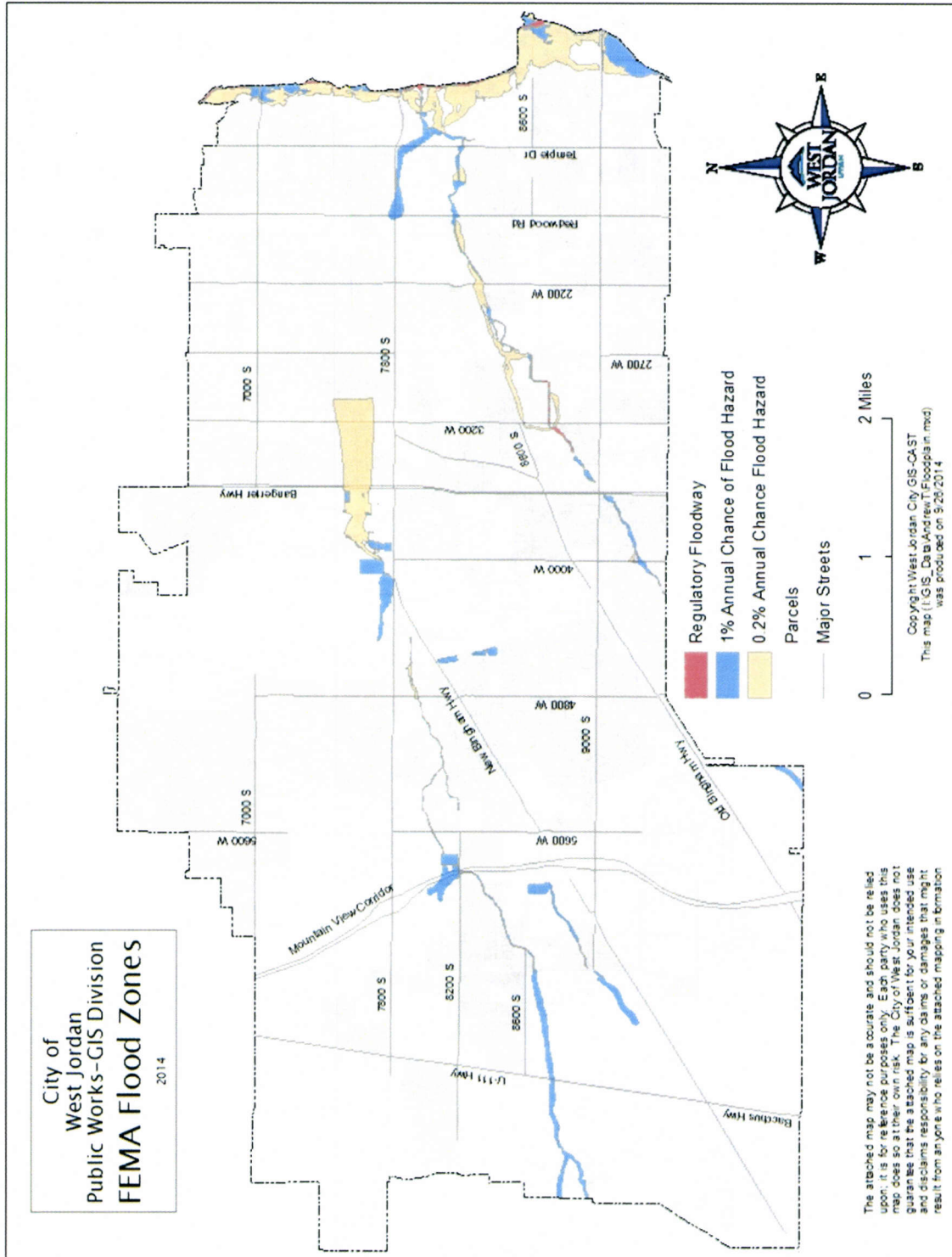
Multi-Hazard Mitigation Plan

Thunderstorms	Negligible	Highly Likely	6-12 hours	Limited	These events often trigger flooding. Microburst storms have caused many homes to have flooding that are not in a mapped floodplain.	Medium
Tornado	Limited	Possible	Minimal	Limited	Unlikely to occur, but they have been more frequent in Utah in recent years	Low
Wildfire	Negligible	Possible	Minimal	Limited	Will most likely occur near the Jordan River or in the western portions of the City.	Low

Multi-Hazard Mitigation Plan

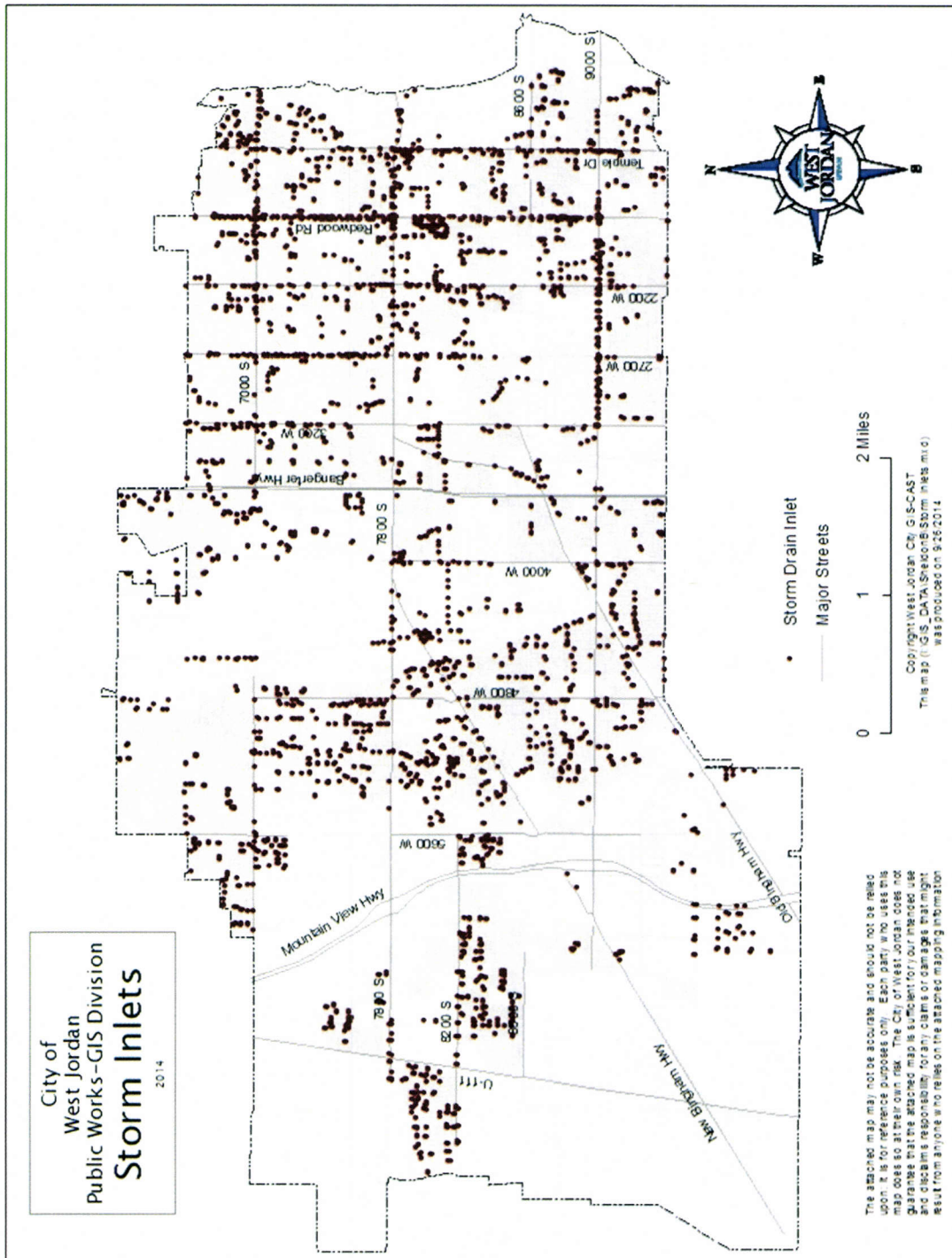
Q.3.2 Hazard Maps

Q.3.2.1 Flood Hazard Map



Multi-Hazard Mitigation Plan

Q.3.2.2 Geologic Hazard Map



Q.3.3 Identification of Critical Facilities and Assets by Location

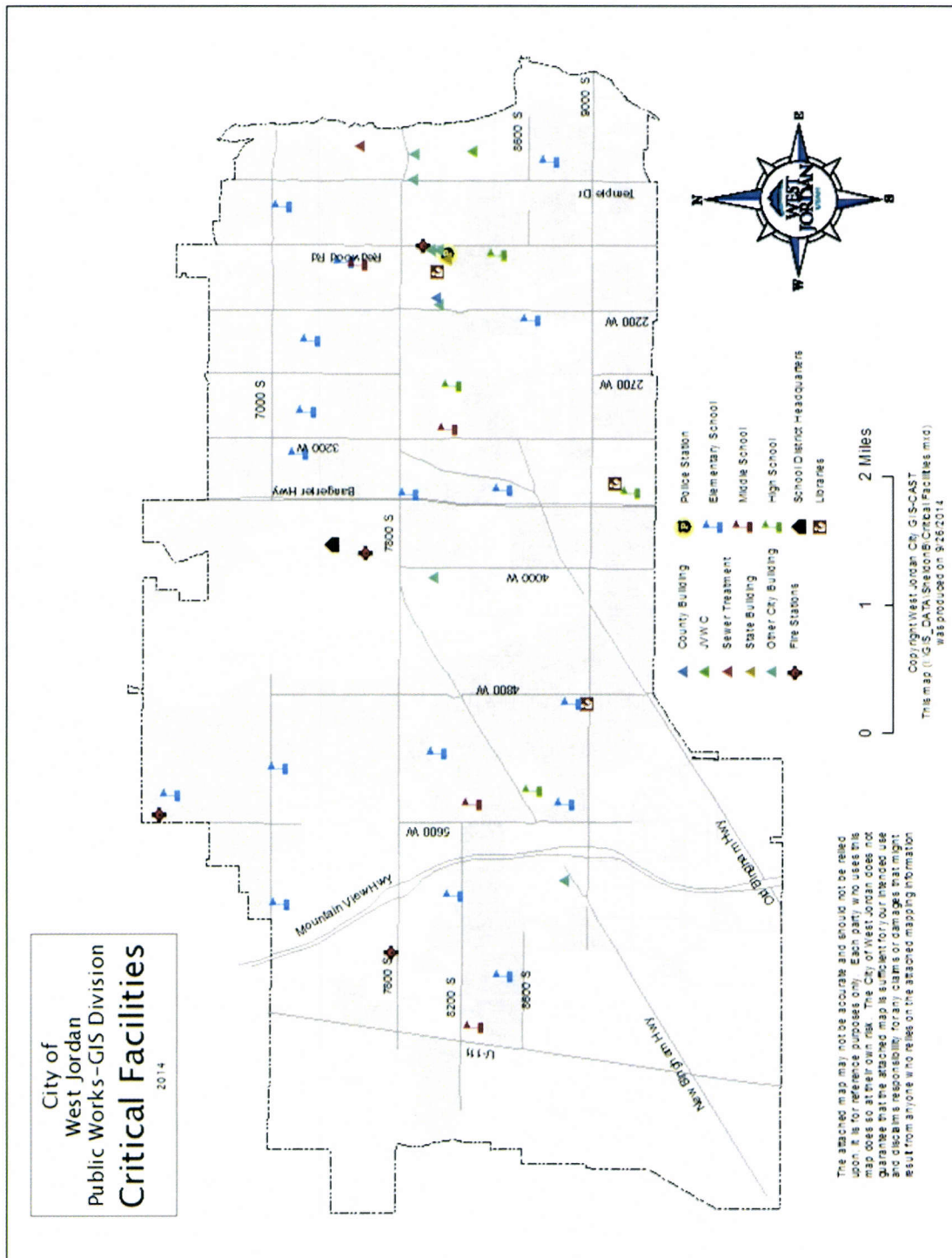


Figure Q.10 Map showing location of some Critical Facilities.

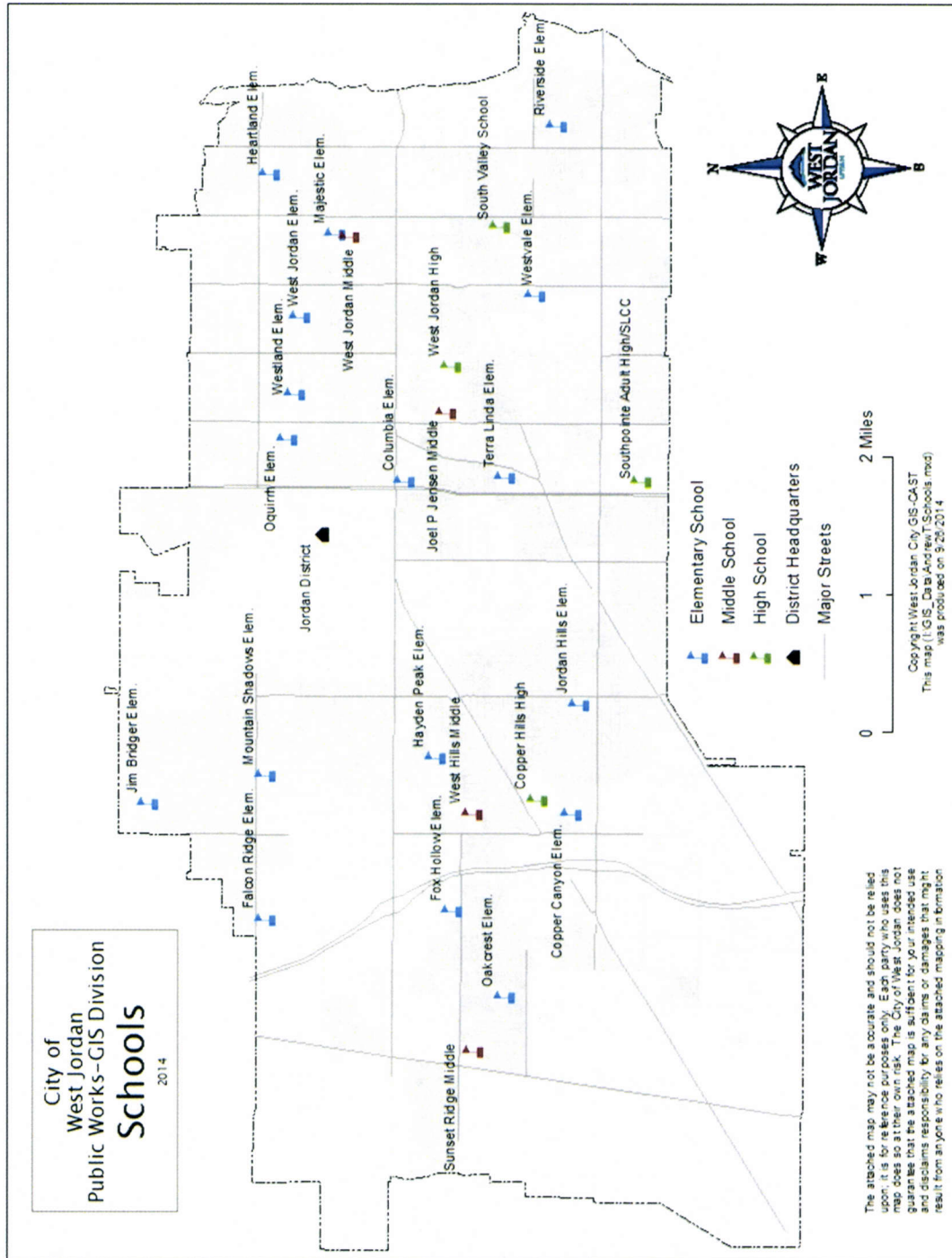
Q.3.3.1 Government Buildings

Several governmental buildings are located in West Jordan. A portion of these buildings are essential for community service in the event of a large scale disaster or emergency. The buildings that are critical in nature consist of fire stations, police stations, city hall, and public works facilities. Other less than critical buildings include the post office and animal shelter.

Multi-Hazard Mitigation Plan

Q.3.3.2 Schools/Universities

West Jordan City has multiple schools located in its city limits.



Map showing location of schools and other educational institutions.

Multi-Hazard Mitigation Plan

Q.4 Capability Assessment

Capability Assessment Worksheet - Salt Lake County Mitigation Plan

Local mitigation capabilities are existing authorities, policies, programs, and resources that reduce hazard impacts or that could be used to implement hazard mitigation activities. Please complete the tables and questions in the worksheet as completely as possible. Complete one worksheet for each jurisdiction.

Planning Team/Emergency Managers:

Please complete this worksheet in coordination with your jurisdiction's city planners, economic development, building and zoning officials, engineers, floodplain administrators, GIS Analyst or others as appropriate.

Completed By: Reed G. Scharman, Deputy Chief / EPM

Jurisdiction: City of West Jordan

Participants (Name, Title):

Julie Davis, Administrative Assistant, Economic Development

Greg Davenport, Capital Projects Engineer

Reed G. Scharman, Emergency Management

_____, _____

_____, _____

_____, _____

Planning and Regulatory Capabilities

Planning and regulatory capabilities are the plans, policies, codes, and ordinances that prevent and reduce the impacts of hazards. Use these questions to identify gaps in community growth guidance plans. Identify possible improvements that could be made to reduce vulnerability in future development.

Please identify the following your jurisdiction has in place.

Building Code, Permitting, and Inspections	Yes/No	
Building Code(s) that reference hazards:		Version/Year. Are building codes adequate?
International Fire and Building Codes	Yes	2012 International Code Set Adopted by the State of Utah and City of West Jordan

Multi-Hazard Mitigation Plan

Site plan review requirements		Do site reviews consider natural hazards?
West Jordan Zoning Regulations	Yes	Yes

1. Does the building code contain provisions to strengthen or elevate construction to withstand hazard forces? The West Jordan Municipal Code and the 2012 IFC set standards for construction that includes snow weight capability, wind speed loading and seismic bracing.

Please indicate which of the following your jurisdiction has in place that reference natural hazards.

Land Use Planning and Ordinances	Yes/No	Is the ordinance an effective measure for reducing hazard impacts? Are there any weaknesses or gaps in the ordinance to be addressed to better improve hazard risk reduction?
Zoning ordinance(s) West Jordan Municipal Code	Yes	The code is inclusive and updated if needed.
Subdivision ordinance(s) West Jordan Municipal Code	Yes	The code is inclusive and updated if needed.
Natural hazard specific ordinances (storm water, steep slope, wildfire) Hillside Protection and Grading Standards	Yes	Municipal Code
Floodplain ordinance Engineering Standards reference FEMA maps	Yes	
Flood insurance rate maps, other floodplain studies		
Policies for acquisition of land for open space and public recreation uses	Yes	West Jordan Parks Master Plan and General Plan
Other		

2. Does the future land-use map clearly identify natural hazard areas? Rivers, creeks, canals and drainages are indicated.

3. Do land-use policies and zoning ordinances discourage development or redevelopment within natural hazard areas? **Perhaps stated differently: Do land-use policies and zoning ordinances encourage the implementation of appropriate mitigation efforts where natural hazards are encountered? Answer, Yes.**

Multi-Hazard Mitigation Plan

4. Do zoning ordinances prohibit development within, or filling of, wetlands, floodways, and floodplains? **Yes**

The following regulatory tools are used by communities to implement hazard mitigation activities. Please indicate which of the following plans your jurisdiction has in place.

Plans	Yes/No Year	Does the plan address hazards? Does the plan identify projects to include in the mitigation strategies? Can the plan be used to implement mitigation actions?
Comprehensive/Master Plan	Yes 2012	
Capital Improvements Plan	Yes 2013	
Economic Development Plan	Yes 2012	
Local Emergency Operations Plan	Yes 2012	
Recovery Plan	No	
Continuity of Operations Plan	No	
Transportation Plan	Yes 2008	
Storm Water Management Plan	Yes 2007	
Community Wildfire Protection Plan	No	Public lands wildfire potential limited to Jordan River trail and west side dry farms.
Other plans or hazard studies (brownfields, redevelopment, disaster recovery, climate change adaptation)	Yes 2006	Culinary Water Master Plan
How can these building codes, planning and zoning ordinances, and other community plans be expanded and improved to reduce risk?		

5. Are goals and policies in the comprehensive plan related to the local hazard mitigation plan? Please specify. **No, there is not a direct reference in the 2012 plan.**

Multi-Hazard Mitigation Plan

6. Do economic development or redevelopment strategies include provisions for mitigating natural hazards? Specify: **Engineering analysis is required as part of all plan reviews and approvals.**
7. Do subdivision regulations restrict the subdivision of land within or adjacent to natural hazard areas? **Yes. Hillside Ordinance and FEMA Flood Plain mapping requirements.**
8. Do capital improvement or other plans limit expenditures on projects that would encourage development in areas vulnerable to natural hazards? **No**
9. Do infrastructure policies limit extension of existing facilities and services that would encourage development in areas vulnerable to natural hazards? **No**
10. Does the capital improvement or other plan provide funding for hazard mitigation projects? **Yes**
11. Do transportation plans limit access to hazard areas? **No**
12. Are transportation systems designed to function under disaster conditions (e.g. evacuation)? **No. Evacuation routes are not posted.**

Administrative and Technical

Identify whether your community has the following administrative and technical capabilities. These include staff and their skills and tools that can be used for mitigation planning and to implement specific mitigation actions. If there are public resources at the next higher level of government that provide technical assistance or resources, indicate in your comments.

Staff	Yes/No FT/PT	Are staff trained on hazards and mitigation?
Planning Commission	Yes/PT	Yes
Zoning Administrator	Yes/FT	Yes
Chief Building Official	Yes/FT	Yes
Floodplain Administrator	Yes/FT	Yes, City Engineer
Emergency Manager	Yes/FT	Yes
Community Planner	Yes/FT	Yes
Civil Engineer	Yes/FT	Yes
GIS Coordinator	Yes/FT	Yes
Others with understanding of natural hazards or with technical hazard assessment skills	Yes/FT	Fire Marshal, Building Inspectors, Engineering Inspectors, Staff Engineers, Water System Operators
Administration	Yes/No	Describe capability

Multi-Hazard Mitigation Plan

Maintenance programs to reduce risk (tree trimming, clearing drainage systems, etc)	Yes	West Jordan has a full time Urban Forester.
Mutual aid agreements	Yes	Utah WARN, Fire Department Mutual Aid
Technical	Yes/No	Has capability been used to assess/mitigation risk in the past? If so, were needs for improvement identified?
Warning systems/services (Reverse 911, outdoor warning signals)	Yes	Handled through Valley Emergency Communications Center
Hazard data and information	Yes	Local Emergency Planning Committee was formed.
Grant writing	Yes	The City has a full time grant writer.
HAZUS or other GIS analysis tools	Yes	GIS department trained in the use of Hazus
Other		
How can staff, administration or technical capabilities be expanded or improved to reduce risk?		

Public Education and Outreach

Identify education and outreach programs and methods already in place that could be used to implement mitigation activities and communicate hazard-related information.

Program/Organization	Yes/No	Could the program help implement future mitigation activities?
Local citizen groups, non-profit organizations	Yes	Exchange Club, Rotary Club, West Jordan Chamber of Commerce, LEPC
Ongoing public education or information program (e.g. responsible water use, fire safety, household preparedness)	Yes	"Ready West Jordan" disaster preparedness program
Natural disaster or safety related school programs	Yes	Fire department assigned fire crew contact with the schools. Police resource officers
StormReady certification	No	
Firewise Community certification	No	
Public-private partnership initiatives addressing disaster-related issues	Yes	

Multi-Hazard Mitigation Plan

Other	Yes	Water Conservation Program Jordan District Safe Schools Committee
How can public education and outreach capabilities be expanded or improved to reduce risk?		

Q.5 Mitigation Strategy

Q.5.1 Mitigation Goals and Objectives

- Earthquake - Increase the number of residents who are trained to set up and operate an emergency shelter.
- Flood - Increase public awareness and compliance with keeping storm drains and ditches free from debris, particularly green waste.
- Wildland Fire - Increase emphasis in our code enforcement efforts to create defensible space between undeveloped fields and residential and commercial property.
- Slope Failure - Enforce the West Jordan Hillside Ordinance to ensure that new development occurs within the requirement.
- Severe Weather - Use the IPAWS system to provide greater warning for individuals living in areas being impacted by severe weather.
- Dam Failure - Create a patterned inspection program to look for signs of weakness.
- Avalanche - Avalanches are not a hazard in West Jordan.
- Pandemic - Emphasis needs to be placed on the development of a citywide continuity of operations plan.
- Drought - West Jordan is researching the possibility of obtaining water from treated waste water and production water sources.
- Infestation - Continue the annual West Jordan weed abatement program through the Code Enforcement unit of the West Jordan City Attorney's Office.
- Radon - Participate in a public awareness campaign to alert homeowners to the presence of radon gas production from the soil.
- Problem Soils - Continue the current application of West Jordan development standards which require soil sampling as part of the geo-technical reports submitted for property development.

Multi-Hazard Mitigation Plan

Q.5.2 Mitigation Actions

Q.5.2.1 Earthquake

Action:

- Increase the number of residents who are trained to set up and operate an emergency shelter.

Issue/Background:

- West Jordan is located within site of the Wasatch and associated faults. The Wasatch Front has recorded large earthquakes in the past and can be expected to experience large earthquakes in the future.
- Earthquakes can create fire, flooding, hazardous materials incidents, transportation incidents, and communications limitations.
- West Jordan can experience liquefaction along the eastern portion of the city, roughly between Redwood Road and the Jordan River.
- Because a significant portion of West Jordan has been built since 1975, its structures may be in better shape than those in other parts of the valley which could lead to a migration of earthquake refugees to West Jordan.
- West Jordan has a memorandum of understanding with the Jordan School District to use middle and high schools as shelter locations. Other buildings in the city are also on the American Red Cross approved shelter list.

Other Alternatives:

- While it is not possible to avoid the total effect of an earthquake, it is possible to buy earthquake insurance to help mitigate some of the repair cost to individuals.

Responsible Office:

- The West Jordan City Manager serves as the Emergency Manager in a declared state of emergency and a Deputy Chief in the Fire Department is assigned as the Emergency Program Manager for the city. In the event of a declared disaster, city ordinance requires the appointment of a Disaster Recovery Officer.

Priority (High, Medium, Low):

- High

Multi-Hazard Mitigation Plan

Cost Estimate:

- \$114,000

Potential Funding:

- General Fund expenditure to increase Fire Department Staffing for the Prevention and Emergency Management Division to hire two Fire Service Officers to provide public education throughout the community.

Benefits (Avoided Losses):

- Training citizens has an immediate and long term impact. An ongoing training program keeps the need for such training in the forefront and it helps those who will both operate and use a shelter in a time of need.

Schedule:

- Ongoing. Continuation of a program started two years ago as a partnership with the Jordan School District and the American Red Cross. Funds are needed to hire personnel to teach the American Red Cross Community Shelter program.

Multi-Hazard Mitigation Plan

Q.5.2.2 Flood

Action:

- Increase public awareness and compliance with keeping storm drains and ditches free from debris, particularly green waste.

Issue/Background:

- Storm water systems are designed to function unimpeded by green waste and other forms of debris.
- Residents who live near ditches and canals have been found to have dumped grass clippings and tree trimmings into these storm water assets.
- West Jordan has developed a stormwater master plan

Other Alternatives:

- Continue to add additional storm drain features to accommodate the loss of capacity due to obstruction.

Responsible Office:

- Public Works Department, Storm Water Manager

Priority (High, Medium, Low):

- High

Cost Estimate:

- \$57,000

Potential Funding:

- General Fund expenditure to increase Storm Water staffing.

Benefits (Avoided Losses):

- \$100,000 in claims made against the city.

Schedule:

- Ongoing

Multi-Hazard Mitigation Plan

Q.5.2.3 Wildland Fire

Action:

- Increase emphasis in our code enforcement efforts to create defensible space between undeveloped fields and residential and commercial property.

Issue/Background:

- A significant amount of acreage in the city is still used as wheat dry farm. There are also developable plots of land that exceed 5 acres in size.
- A vegetation fire can spread rapidly with prevailing winds and spread to fencing, out buildings and finally to primary structures that may be located along the rural-urban interface.

Other Alternatives:

Responsible Office:

- City Attorney, Code Enforcement

Priority (High, Medium, Low):

- High

Cost Estimate:

- \$57,000

Potential Funding:

- General Fund expenditure to increase Code Enforcement staffing.

Benefits (Avoided Losses):

- \$1,000,000 in potential fire loss and additional risk to loss of life and injury to firefighters and residents.

Schedule:

- Ongoing

Multi-Hazard Mitigation Plan

Q.5.2.4 Slope Failure

Action:

- Enforce the West Jordan Hillside Ordinance to ensure that new development occurs within the requirement.

Issue/Background:

- It is possible to construct buildings on slopes that have a high potential for slipping.
- Slopes that are too steep impede the ability of the fire department to respond to an emergency.

Other Alternatives:

- Allow individual property owners to assess their property.

Responsible Office:

- West Jordan City Engineer

Priority (High, Medium, Low):

- Low

Cost Estimate:

- \$100,000

Potential Funding:

- General Fund allocation by the City Council to maintain the position of City Engineer.

Benefits (Avoided Losses):

- We avoid developing in a manner that would risk home and business development to long term problems and costs.

Schedule:

- Ongoing

Multi-Hazard Mitigation Plan

Q.5.2.5 Severe Weather

Action:

- Use the IPAWS system to provide greater warning for individuals living in areas being impacted by severe weather.

Issue/Background:

- West Jordan is large enough that different parts of the city can be impacted by weather events.
- People become less motivated to respond when they receive general warnings and then do not experience an event. Thus targeting the impacted areas with information is more beneficial

Other Alternatives:

Responsible Office:

- West Jordan Emergency Management

Priority (High, Medium, Low):

- High

Cost Estimate:

- \$5,000

Potential Funding:

- General Fund expenditure to increase Storm Water staffing.

Benefits (Avoided Losses):

- Residents would be able to sandbag in a timely manner and avoid losses from storm runoff.

Schedule:

- Ongoing

Multi-Hazard Mitigation Plan

Q.5.2.6 Dam Failure

Action:

- Create a patterned inspection program to look for signs of weakness in the dam structure.

Issue/Background:

- Bateman Pond has a dam that stores water year-round.
- Most of our dams are detention basins that serve as park space and are filled falling a significant weather event.

Other Alternatives:

Responsible Office:

- West Jordan Public Works Director

Priority (High, Medium, Low):

- Low

Cost Estimate:

- \$25,000

Potential Funding:

- General Fund allotment for waste water utility personnel to inspect the dam annually.

Benefits (Avoided Losses):

- Avoid a failure that could have been avoided through a simple inspection.

Schedule:

- Ongoing

Multi-Hazard Mitigation Plan

Q.5.2.7 Avalanche

Action:

- Avalanches are not a hazard in West Jordan.

Issue/Background:

Other Alternatives:

Responsible Office:

Priority (High, Medium, Low):

Cost Estimate:

Potential Funding:

Benefits (Avoided Losses):

Schedule:

Multi-Hazard Mitigation Plan

Q.5.2.8 Pandemic

Action:

- Emphasis needs to be placed on the development of a citywide continuity of operations plan.

Issue/Background:

- West Jordan is becoming more densely populated and the potential for rapid transmission of a disease is increased.
- West Jordan also has a young population of small children who are prone to habits of touching and tasting that can spread disease rapidly through schools and daycares.
- We have plans for continuity of command but need to work on the ability to work remotely and to relocate major operations if necessary.

Other Alternatives:

- The potential is to do nothing and risk the reduction or elimination of city services for a period of time until workers are able to return to work.

Responsible Office:

- West Jordan Emergency Program Manager
- West Jordan Facilities Manager
- West Jordan IT Manager

Priority (High, Medium, Low):

- High

Cost Estimate:

- \$57,000

Potential Funding:

- General Fund expenditure to increase Storm Water staffing.

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Benefits (Avoided Losses):

- If the pandemic is unavoidable then the implementation of a continuity of operations plan will reduce the reduction in services to the community.

Schedule:

- This is a 2015 project with anticipated updates as needed.

Q.5.2.9 Drought

Action:

- West Jordan is researching the possibility of obtaining water from treated waste water and post-industrial use water sources.

Issue/Background:

- West Jordan is a water supplier to the community from well sources as well as purchasing water from Jordan Valley Water Conservancy District.
- Increasing population and industry are putting a significant demand on conventional water supplies.

Other Alternatives:

- Impose restrictions on commercial and residential water use.

Responsible Office:

- West Jordan Public Works Director

Priority (High, Medium, Low):

- Medium

Cost Estimate:

- \$5,000,000

Potential Funding:

- General Fund expenditure by the City council.

Benefits (Avoided Losses):

- Reuse of water that exists locally may ultimately reduce the ongoing cost of water that will come through increased demand.

Schedule:

- Long term research and development needed.

Multi-Hazard Mitigation Plan

Q.5.2.10 Infestation

Action:

- Continue the annual West Jordan weed abatement program through the Code Enforcement unit of the West Jordan City Attorney's Office.

Issue/Background:

- West Jordan has developed westward from the Jordan River. The land has been largely dry wheat farms ahead of development.
- Winds aid in the spreading of weeds from open lands to otherwise developed property.

Other Alternatives:

- Rely on individual property owners to maintain their property as they desire.

Responsible Office:

- West Jordan City Attorney and West Jordan Code Enforcement Unit.

Priority (High, Medium, Low):

- High

Cost Estimate:

- \$114,000

Potential Funding:

- General Fund expenditure to maintain code enforcement officers.
- Revenue from enforcement results in revenue from civil penalties paid by property owners.

Benefits (Avoided Losses):

- The removal of weeds protects important vegetation growth and crop production. It also results in a cleaner looking environment that helps sustain a positive atmosphere.

Schedule:

- Ongoing

Multi-Hazard Mitigation Plan

Q.5.2.11 Radon

Action:

- Participate in a public awareness campaign to alert homeowners to the presence of radon gas production from the soil.

Issue/Background:

- Salt Lake County is in the process of developing a countywide strategy to address.

Other Alternatives:

Responsible Office:

- West Jordan Emergency Program Manager

Priority (High, Medium, Low):

- Low

Cost Estimate:

- Unable to determine a cost at this time. We have no known reported cases in West Jordan according to the West Jordan City Engineer.

Potential Funding:

Benefits (Avoided Losses):

Schedule:

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Q.5.2.12 Problem Soils

Action:

- Continue the current application of West Jordan development standards which require soil sampling as part of the geo-technical reports submitted for property development.

Issue/Background:

- Fire Station 55 had to have extensive measures taken to keep it from sinking.
- Problem soils had to be over-excavated and subsurface drainage systems created for an apartment complex near 1000 West 9000 South.

Other Alternatives:

- Rely on those purchasing property to do their own soil analysis.

Responsible Office:

- City Engineer

Priority (High, Medium, Low):

- Medium

Cost Estimate:

- \$0 to the City because it is paid for by the developer.

Potential Funding:

- Geo-technical reports are paid for by the person making application for development in the city.

Benefits (Avoided Losses):

- The benefit occurs for each property that is developed because it is required before construction can take place.

Schedule:

- Ongoing

Multi-Hazard Mitigation Plan

Q6 Plan Implementation and Maintenance

Q6.1 Implementation

Mitigation is most successful when it is incorporated into the day-to-day functions and priorities of government and development. The City of West Jordan will utilize the information in the Hazards Mitigation Plan to prepare for future events and plan accordingly.

Q6.2 Maintenance Schedule

Periodic monitoring and updates of this Plan are required to ensure that the goals and objectives for the city are kept current and that local mitigation strategies are being carried out. This Plan has been designed to be user-friendly in terms of maintenance and implementation. This portion of the Plan outlines the procedures for completing revisions and updates. The Plan will also be revised to reflect lessons learned or to address specific hazard incidents arising out of a disaster as needed.

Annual Review Procedures

The City of West Jordan will be responsible to annually review the mitigation strategies described in this Plan, as required by the Utah Division of Emergency Management (UDEM), or as situations dictate such as following a disaster declaration. The process will include the city organizing a Hazards Mitigation Planning committee comprised of individuals from organizations responsible to implement the described mitigation strategies. Progress toward the completion of the strategies will be assessed and revised as warranted. The city emergency manager will regularly monitor the Plan and is responsible to make revisions and updates.

Five-Year Plan Review

The entire Mitigation Plan including any background studies and analysis shall be revised and updated as needed every five years by The City of West Jordan to determine if there have been any significant changes in the city that would affect the Plan. Increased development, increased exposure to certain hazards, the development of new mitigation capabilities or techniques and changes to Federal or State legislation are examples of changes that may affect the condition of the Plan.

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Q6.3 Hazard Mitigation Plan Amendments

The City of West Jordan will amend and update its Hazard Mitigation Plan as needed.

Q6.4 Maintenance Evaluation Process

It will be the responsibility of the designated Emergency Manager, City Manager, Mayor and City Council Members to ensure these actions are carried out no later than the target dates unless reasonable circumstances prevent their implementation (i.e. lack of funding availability).

Funding Sources

Although all mitigation techniques will likely save money by avoiding losses, many projects are costly to implement. The City of West Jordan shall continue to seek outside funding assistance for mitigation projects in both the pre-disaster and post-disaster environment, subject to budget constraints and available funding sources.

Federal Programs

The following federal grant programs have been identified as funding sources which specifically target hazard mitigation projects:

Title: Pre-Disaster Mitigation Program

Agency: Federal Emergency Management Agency

Through the Disaster Mitigation Act of 2000, Congress approved the creation of a national program to provide a funding mechanism that is not dependent on a Presidential Disaster Declaration. The Pre-Disaster Mitigation (PDM) program provides funding to states and communities for cost-effective hazard mitigation activities that complement a comprehensive mitigation program and reduce injuries, loss of life, and damage and destruction of property.

The funding is based upon a 75% Federal share and 25% non-Federal share. The non-Federal match can be fully in-kind or cash, or a combination. Special accommodations will be made for “small and impoverished communities”, who will be eligible for 90% Federal share/10% non-

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Federal. FEMA provides PDM grants to states that, in turn, can provide sub-grants to local governments for accomplishing the following eligible mitigation activities:

- State and local Natural Hazard Pre-Disaster Mitigation Planning
- Technical assistance (e.g. risk assessments, project development)
- Mitigation Projects
- Acquisition or relocation of vulnerable properties
- Hazard retrofits
- Minor structural hazard control or protection projects
- Community outreach and education (up to 10% of State allocation)

Title: Flood Mitigation Assistance Program

Agency: Federal Emergency Management Agency

FEMA's Flood Mitigation Assistance program (FMA) provides funding to assist states and communities in implementing measures to reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes and other structures insurable under the National Flood Insurance Program (NFIP). FMA was created as part of the National Flood Insurance Reform Act of 1994 (42 USC 4101) with the goal of reducing or eliminating claims under the NFIP.

FMA is a pre-disaster grant program, and is available to states on an annual basis. This funding is available for mitigation planning and implementation of mitigation measures only, and is based upon a 75% Federal share/25% non-Federal share. States administer the FMA program and are responsible for selecting projects for funding from the applications submitted by all communities within the state. The state then forwards selected applications to FEMA for an eligibility determination. Although individuals cannot apply directly for FMA funds, their local government may submit an application on their behalf.

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Title: Hazard Mitigation Grant Program

Agency: Federal Emergency Management Agency

The Hazard Mitigation Grant Program (HMGP) was created in November 1988 through Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act. The HMGP assists states and local communities in implementing long-term mitigation measures following a Presidential disaster declaration.

To meet these objectives, FEMA can fund up to 75% of the eligible costs of each project. The state or local cost-share match does not need to be cash; in-kind services or materials may also be used. With the passage of the Hazard Mitigation and Relocation Assistance Act of 1993, federal funding under the HMGP is now based on 15% of the federal funds spent on the Public and Individual Assistance programs (minus administrative expenses) for each disaster.

The HMGP can be used to fund projects to protect either public or private property, so long as the projects in question fit within the state and local governments overall mitigation strategy for the disaster area, and comply with program guidelines. Examples of projects that may be funded include the acquisition or relocation of structures from hazard-prone areas, the retrofitting of existing structures to protect them from future damages; and the development of state or local standards designed to protect buildings from future damages.

Eligibility for funding under the HMGP is limited to state and local governments, certain private nonprofit organizations or institutions that serve a public function, Indian tribes and authorized tribal organizations. These organizations must apply for HMPG project funding on behalf of their citizens. In turn, applicants must work through their state, since the state is responsible for setting priorities for funding and administering the program.

Title: Public Assistance (Infrastructure) Program, Section 406

Agency: Federal Emergency Management Agency

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FEMA's Public Assistance Program, through Section 406 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, provides funding to local governments following a Presidential Disaster Declaration for mitigation measures in conjunction with the repair of damaged public facilities and infrastructure.

The mitigation measures must be related to eligible disaster related damages and must directly reduce the potential for future, similar disaster damages to the eligible facility. These opportunities usually present themselves during the repair/replacement efforts.

Proposed projects must be approved by FEMA prior to funding. They will be evaluated for cost effectiveness, technical feasibility and compliance with statutory, regulatory and executive order requirements. In addition, the evaluation must ensure that the mitigation measures do not negatively impact a facility's operation or risk from another hazard.

Public facilities are operated by state and local governments, Indian tribes or authorized tribal organizations and include:

- Roads, bridges & culverts
- Draining & irrigation channels
- Schools, city halls & other buildings
- Water, power & sanitary systems
- Airports & parks

Private nonprofit organizations are groups that own or operate facilities that provide services otherwise performed by a government agency and include, but are not limited to the following:

- Universities and other schools
- Hospitals & clinics

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- Volunteer fire & ambulance
- Power cooperatives & other utilities
- Custodial care & retirement facilities
- Museums & community centers

Title: Small Business Administration (SBA) Disaster Assistance Program

Agency: U.S. SBA

The SBA Disaster Assistance Program provides low-interest loans to businesses following a Presidential disaster declaration. The loans target businesses to repair or replace uninsured disaster damages to property owned by the business, including real estate, machinery and equipment, inventory and supplies. Businesses of any size are eligible, along with non-profit organizations.

SBA loans can be utilized by their recipients to incorporate mitigation techniques into the repair and restoration of their business.

Title: Community Development Block Grants

Agency: US Department of Housing and Urban Development

The Community Development Block Grant (CDBG) program provides grants to local governments for community and economic development projects that primarily benefit low- and moderate-income people. The CDBG program also provides grants for post-disaster hazard mitigation and recovery following a Presidential disaster declaration.

Funds can be used for activities such as acquisition, rehabilitation or reconstruction of damaged properties and facilities and for the redevelopment of disaster areas.

State Programs

Local

Local governments depend upon local property taxes as their primary source of revenue. These taxes are typically used to finance services that must be available and delivered on a routine and regular basis to the general public. If local budgets allow, these funds are used to match Federal or State grant programs when required for large-scale projects.

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Non-Governmental

Another potential source of revenue for implementing local mitigation projects are monetary contributions from non-governmental organizations, such as private sector companies, churches, charities, community relief funds, the American Red Cross, hospitals, land trusts and other non-profit organizations.

Paramount to having a Plan deemed to be valid is its implementation. There is currently no new fiscal note attached to the implementation of this Plan.

Q6.5 Continued Public Involvement

Throughout the planning process, public involvement has been and will be critical to the development of the Hazard Mitigation Plan and its updates. The Plan will be available on the The City of West Jordan website to provide opportunities for public participation and comment. The Plan will also be available for review at the offices of The City of West Jordan.

Participation

All citizens of the region are encouraged to participate in the planning process, especially those who may reside within identified hazard areas. Adequate and timely notification to all area residents will be given as outlined above to all hearings, forums, and meetings.

Access to Information

Citizens, public jurisdictions, agencies and other interested parties will have the opportunity to receive information and submit comments on any aspect of the Natural Hazards Pre-Disaster Mitigation Plan.

Technical Assistance

Residents as well as local jurisdictions may request assistance in accessing the program and interpretation of mitigation projects.

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Public Hearings and Meetings Concerning the Plan

Hearings and meeting concerning the plan will be conveniently timed for people who might benefit most from mitigation programs. Hearings and meeting will be accessible to people with disabilities (accommodations must be requested in advance according to previously established policy).

Hearings and meeting will be adequately publicized. Hearings and meetings may be held for a number of purposes or functions including to: Identify and profile hazards, develop mitigation strategies, and review plan goals, performance and future plans.

Future Revisions

Future revisions of the Hazard Mitigation Plan shall include:

- Expanded vulnerability assessments to include flood and dam failure inundation.
- Continue the search for more specific mitigation actions.
- An analysis of progress of the Plan as it is revised.
- Expanded look into how the identified natural hazards will affect certain populations including the young and elderly.

Implementation and maintenance of the plan is critical to the overall success of hazard mitigation planning.

Q7 Hazard Mitigation Plan Adoption

It is the intent of the City of West Jordan that this Hazard Mitigation Plan will be adopted by resolution once approved by the State of Utah and FEMA, which approval should be within five years of the previous Hazard Mitigation Plan's approval date. This process will be documented through The City of West Jordan Recorder's office.